# RESILIENT NJ NORTHEASTERN NEW JERSEY

### **ABOUT OUR REGION**

**APRIL 2021** 



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RESILIENT NORTHEASTERN NEW JERSEY

Resilient Northeastern NJ is always seeking your feedback to guide the program and ensure it is reflective of perspectives and priorities from across the region. Please continue to share your feedback on the program and get in touch with us through either of the options below:

- BY EMAIL: ResilientNENJ@gmail.com
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# **RESILIENT NJ NORTHEASTERN NEW JERSEY**

### **ABOUT OUR REGION**

**APRIL 2021** 

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RESILIENT NEW JERSEY

THE HACKENSACK RIVERWALK Portion of the walkway in Bayonne's Richard A, ski Park looking towards the Newark Bay Bridge. Image Source: Hudson County Division of Planning

# **01 - INTRODUCTION**

### **ABOUT RESILIENT NEW JERSEY**

Resilient Northeastern New Jersey is part of the Resilient New Jersey program, administered by the New Jersey Department of Environmental Protection (NJDEP) and funded by the U.S. Department of Housing and Urban Development (HUD).

Resilient New Jersey is bringing together resilience experts, local leaders, community organizations, residents, and regional infrastructure entities in four regions across coastal New Jersey to develop solutions to reduce flood risk and build resilience. As we saw during Hurricane Sandy, flooding can have devastating impacts on people's lives and present major impacts on the economy. With climate change, these risks will increase. Through this collaboration, the initiative will result in the development and implementation of regional resilience and adaptation action plans to address these risks and prevent future flood damage. The four regions are Northeastern New Jersey, which is the focus of this report, Raritan River and Bay Communities, Long Beach Island, and the Atlantic County Coastal Region.

In addition to using regional planning approaches to address current and future flood-related hazards and promote the health and well-being of coastal and riverine communities, Resilient New Jersey emphasizes:

- The use of current best available information and data
- A commitment to diversity, equity, and inclusion in decision making processes
- A focus on community health and well-being

An approach that builds on existing efforts and capabilities

**Resilience** means being able to adapt to changing conditions, such as those driven by climate change, and grow in the face of disruption or challenges. Resilience is about creating physical change that you can see and that will prevent flood damage, as well as creating strong civic and governance systems that support inclusive decision-making so we can equitably adapt to changing conditions. We want to advance projects that reduce risk while building the kind of region we want for our communities and the next generation.

**Flooding** can come from rainfall, overwhelmed sewer systems, overflowing rivers, coastal storms, or high tides. Flooding is more significant at lower elevations and can be made worse when drainage systems lack necessary capacity or paved surfaces prevent rainfall from being absorbed. Coastal storms can cause flooding when strong winds lead to large waves, or storm surge, that overtop bulkheads or coastal barriers.

#### Working Project Mission

The Steering Committee developed the following working mission statement, which will evolve as the project progresses and as input is received from additional stakeholders.

The Resilient Northeastern New Jersey project will provide a clear vision and roadmap for flood risk reduction and resilience approaches developed through deep regional collaboration between local and state governments and community-based organizations. The plan will leave a legacy of regional investment and information and resource sharing to help our people and places thrive in the decades to come. The plan will be driven by best available data and technical evaluation and by inclusive and equitable engagement, and will leverage best practices to create social, environmental, and economic benefits, and bring value to all who will share in the region's future.

RESILIENT NORTHEASTERN NEW JERSEY

#### RESILIENT RARITAN RIVER AND BAY COMMUNITIES

RESILIENT LONG BEACH ISLAND

#### RESILIENT ATLANTIC COUNTY COASTAL REGION



### ABOUT RESILIENT NORTHEASTERN NEW JERSEY

The Resilient Northeastern New Jersey project region includes the municipalities of Jersey City, Newark, Hoboken, and Bayonne. The project is guided by a Steering Committee that includes representatives from each municipality, as well as Hudson County, HOPES Community Action Partnership, and the Ironbound Community Corporation. The Steering Committee has convened a Community Advisory Council, comprised of a diverse group of representatives who live in each municipality, and is partnering with local organizations to expand the reach to people who could benefit or be affected by the project. The project also features a robust engagement strategy to maximize access to information about the project and empower engagement in its decision making processes, with a special emphasis on underserved and socially vulnerable populations. See www.resilient.nj.gov/nenj for more on engagement.

Resilient Northeastern New Jersey will bring together the people who live, work, and play in the area, alongside government, business, infrastructure providers, engineers, scientists, and community organizations to create a clear and equitable <u>action plan</u> to address current and future flooding, while improving quality of life.

Working closely with the community and best available data, Resilient Northeastern New Jersey will identify community visions and priorities and infrastructure and communities that are most at risk of flooding now and in the future. These steps will lead to development of potential scenarios or alternatives for addressing the identified risks and priorities, which will be evaluated by our communities and formed into a clear roadmap for implementation. This process breaks into four clear steps with associated critical questions we must ask.



### **ABOUT THIS REPORT**

This report was developed through collaboration with the Resilient Northeastern New Jersey Steering Committee. It describes key features of the region and its cities that are important to understand when planning for reduced flood risk and better quality of life in the future. The goal of the report is to acknowledge the individual nature of each municipality while also highlighting shared regional interests and initiatives. This report also summarizes past and ongoing work to advance resilience in the region. The <u>action plan</u> that will come out of Resilient Northeastern New Jersey will ideally support and advance, but never supplant, disrupt, or duplicate, other effective ongoing work that is highlighted in this report.

### **DIVERSITY, EQUITY, AND INCLUSION**

This project has the potential to impact thousands of people in underserved communities, for generations to come. Therefore, incorporating the principles of diversity, equity, and inclusion into project processes and outcomes is critical to the success of Resilient Northeastern NJ.

#### OUR COMMITMENTS TO INCORPORATE DIVERSITY, EQUITY, AND INCLUSION:

- Ensuring that project processes prioritize the voices of historically underserved communities
- Acknowledging and confronting our history of systemic racism and discrimination
- Sustaining action and assessment of progress towards equitable resilience goals and towards the reduction of existing disparities

#### SOME WAYS THAT WE ARE WORKING TO ACCOMPLISH THIS INCLUDE:

- Reaching out to potential partner organizations to help lead engagement and get input from the people they serve
- Providing multiple different ways to engage as easily as possible
- Providing ways to get and receive information in multiple languages
- Creating a Community Advisory Council made up of a diverse group of residents from each community

### OUR DEFINITIONS

### DIVERSITY

Variety and differences in the people who participate in project processes, whether by their experiences, race, culture, age, language, or other characteristics

### EQUITY

Goes beyond equality, which is fair and just treatment of all potential and existing community members

Means ensuring that decision-making processes and project outcomes, including burdens and benefits, are responsive to the diverse needs, challenges, and histories of people who could be affected

Involves creation of opportunities to address historic, current, and future disadvantages for underrepresented populations

### INCLUSION

Is achieved when a diverse group of people feel and are welcomed into decision-making and project processes

#### FILLING OF TIDAL WETLANDS IN SOUTHWEST HOBOKEN

View from Jersey City looking east circa 1870-1890. Image Source: Hoboken Historical Collection via City of Hoboken The history of our region helps to provide context for the current strengths and challenges that we face. This chapter provides an overview of events and trends in our region's history that shaped our region as we know it today, with a specific focus on history relevant for our region's most flood-prone areas.

Northeastern New Jersey has been shaped, geographically and culturally, by its relationship with water, and the development activities that built neighborhoods in areas where water previously flowed. Hoboken is bounded by the Hudson River to the east and Jersey City to the west. Jersey City has a bi-coastal geography, with the Hudson River and Upper New York bay to the East, and the Hackensack River to the west. Bayonne is a peninsula south of Jersey City that is surrounded by the Upper New York Bay, the Kill Van Kull to the south, and the Newark Bay to the west. Newark's northeastern and eastern boundaries are carved out by the Passaic River and Newark Bay.

# 02 - OUR HISTORY

#### INDIGENOUS AND COLONIAL PAST

Prior to Dutch and British settlement in the 1600s, what is now the Northeastern New Jersey region was home to the Lenape people. The tribes migrated seasonally and likely practiced small-scale agriculture along with hunting, gathering, and fishing the abundant shellfish in surrounding waters. The Lenape legacy is apparent in local place names such as Hoboken and Communipaw, which are derived from the Algonquian language.

Henry Hudson arrived in the area that is now Bayonne, Hoboken, and Jersey City in 1609, and the area was settled by Dutch colonists throughout the first half of the 17th century. Relations between the Lenape and Dutch were tense, and from 1643 to 1645 the two groups fought in the Wappinger War, or Kieft's War, which was precipitated by the massacre of Lenape people in their camps. In 1658, the Dutch purchased the area then known as Bergen from the Lenape; the land came under formal British control in 1674. Newark was settled separately by Puritan colonists from Connecticut who purchased the land from the Lenape in 1666. Members of the Lenape tribe relocated to a reservation in Burlington County, New Jersey in the late 1700s, also later sold.

Understanding the indigenous and colonial history of the now heavily urbanized landscape is important to planning today: to help honor the true history of the area, to understand the region's prior relationship with water and to explore the extent to which that relationship could be revived, as well as to understand and hopefully refrain from continuing to make the mistakes of the past. The trends of shifting demographics and forced change have continued beyond their origins in the seventeenth century and into today, as described in the following sections. The threat of climate change, population migration into and out of the area, and the potential for uneven investments in flood risk reduction infrastructure could similarly lead to inequitable outcomes.

#### **INDUSTRIAL GROWTH**

The 1800s and early 1900s can be characterized by construction of major transportation infrastructure in the area, due to the region's coastal setting and proximity to New York City. This new transportation infrastructure included steamboat ferries that brought residents across the Hudson River to New York City, shipping terminals and port facilities, railroad systems to bring cargo to other regions, passenger railroads, the Hoboken Terminal, the Morris Canal, and the Hudson Tubes (now the PATH tunnels to Manhattan). In the late 1800s, people living in Manhattan knew Hoboken and Bayonne as resort destinations.

#### **Our History with Water**

At the time of European settlement, large areas surrounding the present day Hackensack and Passaic Rivers were tidal wetlands. The wetlands ranged from mostly freshwater in the upper portions to higher salinity waters in the southern portions near today's Newark. Hoboken was previously a marshy island that the Lenape people inhabitated seasonally. A lack of understanding of the ecological and recreational values of wetlands allowed them be altered and developed over time. For example, a survey in 1896 estimated that the area between the Hackensack and Passaic Rivers consisted of 43 square miles of wetlands, but the current area – known as the Meadowlands – is about 13 square miles of wetlands. This area included wetlands previously known as the Newark Meadows, which have since been developed into Port Newark, Newark Liberty International Airport, and the New Jersey Turnpike. Initial alterations of the Meadowlands consisted of draining the wetlands using dikes to create farmland. Later, beginning in the late 1800s, activities such as dredging of the Passaic and Hackensack Rivers and diversion of water upstream for municipal drinking water systems increased the salinity of the Meadowlands, leading to displacent of plant species such as cedar trees that previously forested the area.

Beginning in the 1900s, much development in the region began to occur through placement of fill material to displace wetlands or elevate existing land, as further described in the **Our Region** section of this report. As shown in this map, large portions of our region sit atop this fill material, with fill material covering over 30 percent of the land areas of Jersey City, Newark, and Hoboken, and over 20 percent of the land area of Bayonne.



RVINGTON

#### **POPULATION SHIFTS**

In the early 1900s, immigrants who passed through Ellis Island came to settle in the area. Industry and port facilities shifted away from Hoboken and into Newark and Bayonne, with construction of Port Newark initiated by the City of Newark in 1914. Population peaked in the 1940s and 1950s when wealthier residents began moving to surrounding suburbs. The population decline and disinvestment that followed contributed to economic struggles from mid-centiry into the 1980s.

Soon after, Hoboken began a period of growth and redevelopment as young commuters and artists began to move into the city. Redevelopmen in Jersey City picked up in the 1980s, primarily centered in the waterfront and downtown areas, and many large companies located offices in the city. Newark began to see revitilization of the downtown area starting in the 2000s. Redevelopment and new investment has continued, but it has also brought gentrification and displacement of lower-income residents, aging infrastructure, a legacy of contamination from industrial sites, and a history of racial inequity.

Most population growth in New Jersey, and particularly in Hudson and Essex Counties (which contain the project area), in the late 20<sup>th</sup> and early 21<sup>st</sup> centuries was driven by immigration, mostly from Latin America and Asia. Without this movement of peoples, the region's population would have been mostly stagnant.

Public access to the water is a longstanding challenge in places of high development. In 1988, for example, a New Jersey Administrative Law advanced public access to the water. The law requires waterfront property owners to construct

30-foot wide walkway areas along the Hudson River when a property is being redeveloped. At 18.5 miles, the walkway is nearly complete. From Hudson River Waterfront Walkway from the George Washington Bridge to Bayonne, the walkway traverses many waterfront parks that are centers for social and recreational activities.

#### **RACIAL AND ENVIRONMENTAL** JUSTICE

Northeastern New Jersey has a history of racial tension and environmental justice issues that must be considered in any planning process, and particularly in efforts to build resilience. Racial exclusion or red-lining in housing was common here as it was across the country. In Newark, white residents left the city in large numbers in the 1950s but maintained political power, leading to uneven investment and access to resources and decision making influence. Racial tensions reached a peak in 1967 with protests that broke out after police violence towards a black taxi driver. The region and Newark in particular grapples with a number of environmental justice issues today, such as the concentration of air quality issues and combined sewer overflows in neighborhoods with minority populations.

Community organizations, government leaders, and local planners in our region have worked in recent years to acknowledge and address this history of discrimination and environmental justice. The Resilient Northeastern New Jersey project must align with these efforts to ensure that minorities and socially vulnerable populations contribute to the planning process and are prioritized in resiliency measures.

#### HURRICANE SANDY

In October 2012, storm surge from Hurricane Sandy damaged critical regional transportation systems (flooding of PATH stations), utility systems (flooding of electrical substations leading to power outages), and healthcare assets (Bayonne Medical Center and Jersey City Medical Center). Flooding left families stranded in their homes and led to prolonged power outages. In industrial areas of the region, flood waters mixed with pollutants at contaminated sites leading to health concerns for residents. The table below summarizes obligated amounts of FEMA funding that were provided to residents, through Individual Assistance, and cities, through Public Assistance, in the region after Hurricane Sandy.

Hurricane Sandy was one of many flood events that have impacted the region, but was significant in that it underscored the need to strengthen resilience against extreme weather events and catalyzed risk evaluation and implementation of projects aimed at reducing future damage from similar storms. A selection of key completed and planned projects that have already or will significantly alter the region's risk landscape are summarized in the Planning Initiatives section further in this report.

Funding Type	Jersey City	Newark	Hoboken	Bayonne	Hudson County
FEMA Individual Assistance Funding	\$11.76 million	\$3.15 million	\$6.28 million	\$4.68 million	\$27.84 million
FEMA Public Assistance Funding (all entities within the jurisdiction)	\$50.14 million	\$8.05 million	\$16.35 million	\$3.70 million	\$7.96 million

Data Sources: Individual Assistance: NJ Office of the State Comptroller, current as of February 5, 2021; Public Assistance: NJOIT Open Data Center, current as of February 5, 2021

### Flood Extent Scale 1:85,000

HILLSIDE

p.º

**IRVINGTON** 

**RESILIENT NORTHEASTERN NJ / ABOUT OUR REGION** 





Our region is a lively, densely populated region that is heavily interconnected through our transportation networks, waterbodies, cultures, commerce, and workers. This chapter highlights key characteristics that will help us to understand current exposure to flooding and the changes underway that will shape that exposure in the future. Where flood hazard and people, infrastructure, and existing challenges intersect, risk is increased. By understanding how the various characteristics of the region intersect with what we currently know about flood risk and what we will learn through the risk assessment, Resilient Northeastern New Jersey will be better informed on how to focus resources and attention toward both engagement and technical analysis toward reducing risk and building resilience.

## 03 - OUR REGION

### **TOPOGRAPHY & FLOOD HAZARDS**

Northeastern New Jersey has a storied and complex relationship with water as a source of both vitality and destruction. The waterfront offers open space, economic opportunity, and sweeping views of the Manhattan skyline, while also presenting risks like those exposed during Hurricane Sandy. Many neighborhoods also experience localized chronic and hazardous flooding during rainfall events when the sewers are overwhelmed by stormwater. Coastal surge and localized flooding will continue to grow as sea levels rise and rain events increase in intensity over time.

This map shows flood hazard zones mapped by the Federal Emergency Management Agency (FEMA) for insurance and policy purposes. These maps, known as Flood Insurance Rate Maps (FIRMs), are also used by municipalities to set minimum construction and development standards. The areas shown in blue are generally more likely to flood from coastal storms surge or overflowing rivers, however these maps do not incorporate the effects of climate change or include areas that may flood due to heavy rainfall.

As shown in the map, Hoboken lies almost entirely within FEMA mapped flood hazard zones. Large portions of Jersey City and Bayonne along the Hudson River, Upper New York Bay, Kill Van Kull, and Newark Bay are in flood hazard zones. The outcrop of the Palisades sill is an elevated geological feature that runs through north-south along the center of Jersey City and Bayonne, so the central portions of these cities have lower risks of flooding. Most flood hazard zones in Newark are along the Passaic River and Newark Bay, particularly in the eastern industrial areas and port, which were historically tidal wetlands.



Data Source: FEMA Digital Flood Insurance Rate Map (PFIRM-Hudson County, FIRM-Essex County). New Jersey Office of GIS Digital Elevation Model (2018)



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### SOCIALLY VULNERABLE POPULATIONS

Social vulnerability refers to the degree to which a community's people are challenged when faced with significant disruptions, such as natural disasters or disease. For example, low income, non-English speaking, minority, elderly, children, homeless, or physically disabled people are more likely to need support to prepare, respond to, or recover from a flood event. These populations are more likely to have limited financial and physical resources. These members of our community are therefore likely to suffer more from a flood than people who do not experience the same vulnerabilities. At the same time, socially vulnerable groups have persevered through past challenges and daily inequities despite their limited resources. As such, their experiences and perspectives are particularly valuable in planning for increased community resilience. Therefore, the Resilient Northeastern NJ project aims to center the voices of socially vulnerable populations through the planning process to ensure the project integrates their needs and perspectives, leverages their knowledge and inherent resilience to develop improved solutions, and recognizes their lived experiences.

This map shows the social vulnerability of people within the region, based on the Social Vulnerability Index developed by the Centers for Disease Control and Prevention (CDC). In this map, the darker areas are more socially vulnerable and the lighter areas are less socially vulnerable, according to the index.

Resilient Northeastern New Jersey will particularly focus planning with areas where social vulnerability and frequent flooding intersect, as well as with the infrastructure and support systems that serve these areas. According to the index:

- Newark has the largest concentration of socially vulnerable populations of the four municipalities, with all of Newark's census tracts ranking above the 75th-percentile of the social vulnerability index. This includes Newark's East and South Wards, which have areas within the floodplain. In particular, frequent flooding has been documented in the Ironbound neighborhood and Port District.
- In Jersey City, socially vulnerable populations are concentrated in the Greenville, Bergen-Lafayette/ Communipaw, Marion, and Jersey City Heights neighborhoods, and portions of downtown. Many of these neighborhoods are also within the floodplain, with the exception of Jersey Heights. Eastern Greenville and Bergen-Lafayette are majority Black. Greenville also has a growing population of Hasidic Jews. The Jersey City Heights and eastern portion of Bergen-Lafayette/Communipaw have many people identifying as Hispanic.
- Hoboken's socially vulnerable populations are located in the Hoboken Housing Authority low-income and senior housing properties in Southwestern Hoboken. This area is located entirely within the floodplain historically experiences chronic flooding associated with rainfall.
- **Bayonne**'s socially vulnerable populations are located in the center of the city, in the West 20s and East 10s and 20s (Constable Hook). These areas have slightly higher concentrations of Black and Hispanic residents than other areas of Bayonne. They are mostly outside of the floodplain, although the western portion of Constable Hook is within the flood hazard area.

*Data Source:* Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, Geospatial Research, Analysis, and Services Program. CDC Social Vulnerability Index 2018 New Jersey Database

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Social Vulnerability Index (SVI)

Scale 1:85,000

ORANGE

IRVINGTON

**ROSELLE PARK** 

ROSELLE

 0
 0.5
 1
 1.5
 2

 Counties
 Municipalities

 Municipalities

 CDC SVI (Overall)\*

 No Data

 ≤0.25

 ≤0.50

 ≤0.75

 ≤1.00

\*Tract rankings are based on percentiles. Percentile ranking values range from 0 to 1, with higher values indicating greater vulnerability.

hall

The Centers for Disease Control and Prevention (CDC) **Social Vulnerability Index** incorporates 15 factors grouped into four common themes: socioeconomic status, household composition, race/ ethnicity/language, and housing / transportation. The index uses US Census data to rank the social vulnerability of each census tract. As shown, most of the Northeastern New Jersey region has a high concentration of socially vulnerable communities, including lower income, elderly, and minority populations.

GARWOOD



### **POPULATION DENSITY** & GROWTH AREAS

The entire region is heavily urbanized and therefore generally densely populated. As such, areas of particular concern will be those where many people are exposed to flooding and where there may be a high concentration of social vulnerability. Nevertheless, the areas of lowest population density are aligned with industrial and transportation land use areas shown in the **Regional Land Use** map that follows; these are areas that support the movement of goods, people, and services throughout the region. Neighborhoods that are densely populated and are adjacent to bodies of water include the majority of Hoboken, downtown Jersey City, Greenville in Jersey City, portions of Bergen Point in Bayonne, and the Ironbound neighborhood in Newark

*Data Source:* ESRI Persons per Square Mile by Block Group Layer (2012)





### **REGIONAL LAND USE**

The types of land use in coastal and waterfront areas will play a role in shaping the resilience strategies for our region. As shown in this land use map, coastal and waterfront areas are largely industrial or transportation centers, which includes Port Newark, Bayonne's Constable Hook area, Port Jersey, and Military Ocean Terminal at Bayonne (MOTBY). There are several prominent waterfront parks or open spaces areas such as Liberty State Park, the Bayonne Golf Club, and the Stephen R. Gregg Park in Bayonne. Several commercial districts are concentrated along waterfronts such as downtown Newark along the Passaic River, Exchange Place in Jersey City, and downtown Hoboken.

Data Source: NJDEP Open Data Statewide Land Use Layer (2015)





### **DEVELOPMENT ZONES**

The locations shown on this map are the areas where the most significant growth and change in land use may take place in our region in the coming years based on development trends, zoning and future land use maps, and designated growth and development plans. Designated redevelopment areas, shown in green, are a major driver of potential growth and new development. These redevelopment areas are locations where transformative projects may take place through new mixed-use, multi-family residential, industrial, or commercial development. Jersey City, in particular, relies on redevelopment areas for its most important projects, many of which have been built-out. The map also shows locations that are zoned for commercial economic development (pink), multi-family residential development (yellow), water-related commercial uses – including ports (blue), and industrial development (purple). Areas in these zoning categories are also most likely to be centers for development in the coming years. Brownfield redevelopment sites (red hatch) are former or current contaminated sites that are part of a cleanup and redevelopment program through NJDEP.

\*Note – Redevelopment areas shown for Bayonne are only those with redevelopment plans summarized in this report; this is only a portion of all designated redevelopment areas in Bayonne.

**Data Source:** Newark Open Data Zoning Map, Jersey City Open Data Zoning Map, City of Hoboken Zoning Map, City of Bayonne Zoning Map, NJGIN Open Data Brownfield Redevelopment Area Boundaries (Blocks and Lots)

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### **CONTAMINATION & FILL**

Much development after settlement by Europeans took place on filled, low-lying waterfront areas, as shown in this map. Development began to use the approach of filling in low-lying wetland areas to elevate land beginning in the 1900s, and much of the fill was a mix of dredging material from nearby rivers such as the Passaic and Hackensack Rivers; municipal garbage, including garbage from Newark or transported on barges from New York City; or debris from excavations of the trans-Hudson tunnels, skyscraper foundations in New York City and Newark, and subway systems in New York City and Newark.

New land created was typically low-lying and the practice altered the movement of water, leading to current-day flood hazards. Many of the areas within current flood zones are areas that have been filled. For example, Hoboken was originally an island surrounded by the Hudson River to the east and tidal lands bordering the Palisades to the west, but the tidal lands were filled. This filled area of southwest Hoboken has historically experienced chronic stormwater flooding.

Due to the region's history as an industrial center, there are many contaminated sites included in the NJDEP Known Contaminated Sites List. Presence of contaminated soils is also related to historical use of land for open dumps or landfills, such as the use of the Meadowlands area for garbage disposal that started in the mid-1900s. The presence of contamination has led to health hazards during past flood events as flood waters have mixed with pollutants and flooded residential areas.

**Data Source:** NJGIN Open Data Known Contaminated Site List Layer, NJGIN Open Data Historic Fill in New Jersey Layer, NJGIN Open Data Chromate Waste Sites Boundaries Layer, NJGIN Open Data Brownfield Redevelopment Area Boundaries (Blocks and Lots) Layer FEMA Digital Flood Insurance Rate Map (PFIRM-Hudson County, FIRM-Essex County)

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### **Contamination & Fill**

Scale 1:85,000



- Counties
- Brownfield Redevelopment Sites
- Chromate Waste Site
- 🔆 Historic Fill

Active Remediation Parcels

- A : Emergency Action/Stabilization
- B : Single Contamination, affecting only Soils
- C1 : Source Known or Identified, potential Groundwater Contamination
- C2 : Known Source or Release with Groundwater Contamination
- C3 : Unknown or Uncontrolled Discharge to Soil or Groundwater
- D : Mulitple Sources/Releases to Multimedia, including Groundwater
- FEMA Flood Zone

- GARWOOD

- 0.2% Annual Chance Flood Hazard
- AO/A/AE : 1% Annual Flood Risk

CRANFORD

VE : Additional Wave Hazard

**ROSELLE PARK** 

IRVINGTON





### INDUSTRY & MOVEMENT OF GOODS

Northeastern New Jersey is the home of infrastructure that supports the movement of goods across the region and that drives the wider regional economy. The region was historically an industrial center, and as was shown in the **Regional Land Use** map, large portions of waterfront areas are dedicated to industrial uses. Historical port facilities are now concentrated in and around Port Newark, which is part of the largest port on the east coast. An estimated \$200 billion in goods enter the United States through Port Newark annually (based on 2018 data) and an estimated 400,000 jobs are associated with the port. Hoboken and Jersey City have transitioned away from industrial uses over the years as the cities have become more residential and commercial. Heavy industry still remains in parts of Newark and Bayonne. These uses include port facilities and supporting logistics services, bulk storage facilities in Bayonne, and utilities (including power plants and electrical substations).

The region's freight networks are critical assets because they transport goods that arrive through the shipping ports within and around the region. When a link in a supply chain is broken, there can be significant cascading impacts. Northeastern New Jersey's influence on the movement of goods and services regionally and nationally is significant and must be made resilient against any possible disruptions. This project's risk assessment will evaluate the cascading impacts that might be spurred by flood damage to the critical systems that support movement of goods in the region. Through engagement and regional collaboration, the project will propose solutions to address these impacts.

Industry, Energy & Freight Scale 1:85,000 Miles 0.5 1 1.5 2 **Municipalities** Counties Industrial Parcels Transportation/Utilities Major Roadways Port Facilities A Power Plants Substations **Electric Transmission Lines** IRVINGTON **Rail Facilities** Class I Rail Class II Rail ----- Rail lines SPRINGFIELD TOWNSHIP **KENILWORT** ROSELLE PARK CRANFORD ROSELLE GARWOOD

**Data Source:** NJDEP Open Data Statewide Land Use Layer (2015), HIFLD Open Data Electric Substations Layer, HIFLD Open Data Electric Power Transmission Lines Layer, NJDEP Open Data Power Plants of NJ Layer, NJGIN Open Data Railroads Network Layer



# TRANSPORTATION & MOBILITY

Our region is characterized by dense transportation networks that connect the region to New York City, Newark-Liberty International Airport, the Northeast Corridor, and beyond. These networks include NJ TRANSIT buses, trains, and light rail; PANYNJ PATH trains; Amtrak trains; ferries along the Hudson River; the Holland Tunnel; and numerous bridges, such as the Newark Bay Bridge and Bayonne Bridge. Key transit stations include Newark Penn Station and Hoboken Terminal. Many of the transit stations, such as PATH stations and Hoboken Terminal, were flooded during Hurricane Sandy, leading to extended disruptions to public transportation services that impacted people's ability to move around. Since Hurricane Sandy, infrastructure players in the region have made efforts to improve the resiliency of these critical systems. Some of these efforts by NJ Transit and PANYNJ are highlighted in the **Planning Initiatives** chapter of this report.

Despite the region's significant public transportation assets, walking and bicycling as transportation options continue to be a challenge. Each municipality has its own "mobility profile," with Jersey City having Citibike (bike share), Newark having riverfront bike lanes, Hoboken being the "Mile Square" city of a pedestrian-friendly street grid, and Bayonne having a series of connected but far apart waterfront parks that pedestrians and bicyclists may access. Each municipality on its own has taken great strides towards becoming bicycle- and pedestrian-friendly, and as more bicycle and pedestrian facilities have been implemented, overall cyclist safety has improved. Nevertheless, the connectivity between our region's four cities is limited.

One obstacle to bicycle and pedestrian connectivity between our region's cities is the presence of physical limitations, including interstates, arterial roadways, and railroad tracks. These thoroughfares are typically not friendly to walking and bicycling, and therefore act as barriers for these modes of transportation. Bridges crossing major waterways such as the Hackensack River and Newark Bay provide limited opportunities for bicyclists and pedestrians to cross between cities, and safe alternatives are further limited when accommodations for bicyclists and pedestrians are not built along bridges and other infrastructure. The regional focus of this project will be beneficial because it may provide a forum for discussions amongst these municipalities toward resolving connectivity issues.

Heavy vehicular traffic is a barrier to improved mobility of cyclists and pedestrians. This means that significant planning and infrastructure could be required to integrate increased mobility alongside flood protection. Pedestrians, cyclists, and motorists are not mutually exclusive, and the region must balance the safety and comfort of people using all these modes when building resilience.

Note: Bike lane data are from 2018 for Newark, 2019 for Hoboken, and an unknown date for Jersey City, and do not reflect the most up-to-date bike lanes in these cities.

**Data Source:** NJGIN Open Data Bus Stops in NJ Layer, NJGIN Open Data Bus Routes in NJ Layer, City of Hoboken Bike Lane Layer, Newark Bike Lane Layer, Jersey City Bike Lane Layer, NJGIN Passenger Railroad Lines Layer, US Census Tiger Primary and Secondary Roads Layer, HIFLD Public Transit Routes Layer

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### **COMMUTER PATTERNS & FLOWS**

In some ways, Northeastern New Jersey is a community of commuters. This map shows the origins and destinations of commuters in and around the region. Most commuters out of Hoboken and Jersey City work in New York City. Most commuters out of Newark work in other portions of Essex County outside of Newark. The region is also a major employment center in itself, with large offices or headquarters in downtown Jersey City and downtown Newark. There are moderate flows of commuters between the four cities, mostly workers commuting into Newark and Jersey City. More information about employment and major industries in each city can be found in the **Our Communities** section.

#### WHERE DO OUR RESIDENTS WORK?

38% (124,759) of NENJ\* residents work within the region.

Number of NENJ residents	Percent of NENJ residents**	Work in:	
11,138	9%	Bayonne	
9,462	8%	Hoboken	
52,850	42%	Jersey City	
51,309	41%	Newark	

### 62% (206,004) of NENJ\* residents work outside of the region.

۲ د ۷	Number of NENJ vorkers	Percent of NENJ residents***	Work in:	Numb of outs worke
			Elsewhere in Essex County	36,
	23,035		Elsewhere in Hudson County	
			Bergen County	21,
	7,644	4%	Middlesex County	16,
			Monmouth County	8,9
	13,893		Union County	26,
			New York City	25,

#### WHERE DO OUR WORKERS LIVE?

44% (124,759) of the NENJ\* workforce commute from within the region.

lumber of NENJ vorkers	Percent of NENJ workers	Live in:		
16,858	14%	Bayonne		
7,883	6%	Hoboken		
52,373	42%	Jersey City		
47,645	38%	Newark		

### 66% (160,502) of the NENJ\* workforce commute from outside the region.

Number of outside workers	Percent of outside workers	Live in:
36,280	23%	Elsewhere in Essex County
24,600	15%	Elsewhere in Hudson County
21,968	14%	Bergen County
16,719	10%	Middlesex County
8,918	6%	Monmouth County
26,074	16%	Union County
25,943	16%	New York City

\*Northeastern New Jersey, \*\*As a percent of NENJ residents who work inside the region \*\*\*As a percent of NENJ residents who work outside of the region

Data Source: CTPP Dataset, US Census 2012-2016 ACS 5-Year Data Profile

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Scale 1:85,000





# WASTEWATER & STORMWATER

Each of the cities in the Northeastern New Jersey Region has a combined sewer system for wastewater. A combined sewer system carries both stormwater from rainfall and sewage from homes and businesses. Most of the time, combined sewer systems carry sewage from homes and businesses to a wastewater treatment plant for treatment. When it rains, stormwater also enters the combined sewers through catch basins in streets. The sewers are designed so that if it rains enough, some of the combined stormwater and sewage will overflow to rivers or creeks to avoid overwhelming the wastewater treatment plant with a lot of volume to treat, and to avoid back-ups of sewage into people's homes and businesses.

Combined sewer systems present challenges for cities because the water that overflows to rivers or creeks during rain events has not been treated, so it contributes to poor water quality in our waterbodies. This map shows the locations of combined sewer outfalls in the region, where combined sewage (rainwater and sewage from homes and businesses) is released into bodies of water. Furthermore, sometimes the sewer system becomes so overwhelmed that the combined sewage backs up into streets through catch basins and causes localized flooding. This localized flooding associated with the combined sewer system is experienced in many areas of the region today, such as in the Ironbound neighborhood in Newark and in southwest Hoboken. This adds additional health hazards to flood risk and existing social vulnerabilities.

This map also shows the areas in the region that operate under the same wastewater sewer and treatment systems. The sewer systems in Jersey City, Bayonne, and Newark are operated by the Jersey City Municipal Utilities Authority, Suez, and the City of Newark, respectively. All three of these cities convey their wastewater to the Passaic Valley Sewerage Commission treatment plant, which is located in Newark. This plant therefore represents a single point of infrastructure failure across a large area and was significantly impacted from Hurricane Sandy; since then, the facility has seen significant investment to reduce risk. Due to this significant interdependence, solutions that address flooding in these cities by making changes to the sewer systems must be coordinated across the cities and utilities that serve them.

The combined sewer system in Hoboken is owned and operated by the North Hudson Sewerage Authority (NHSA), which also operates the systems in neighboring West New York, Weehawken, and Union City. The Adams Street Wastewater Treatment Plant, which is one of two treatment plants owned and operated by North Hudson Sewerage Authority, is located in Hoboken.

The combined wastewater and stormwater network, coupled with industry and transportation, highlight the interdependence of this region with other places and the level of partnership and cooperation required to reduce risk and build resilience in the near and long-term.

**Data Source:** NJDEP Open Data Combined Sewer Overflow Layer, NJGIN Open Data Sewer Service Area for New Jersey Layer

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### Wastewater

Scale 1:175,000

Miles

Municipalities

Counties

 Combined Sewer Outfalls
 Wastewater Management Plan Agency (Applicable WMP)

Essex County BOCF (PVSC)

Essex County BOCF (Joint Meeting Essex & Union)

> Hudson County BOCF (No Adopted WMP)

Hudson County UA (Hudson County WMP)

Hudson County UA (Secaucus Town WMP)

Joint Meeting Essex and Union (Joint Meeting Essex & Union)



### WATERSHEDS

This map shows the watershed management areas in the Northeastern New Jersey Region and the surrounding areas. Watershed management areas are used for regulatory purposes to establish boundaries for targeted planning and restoration efforts. The three watershed management areas in the Northeastern New Jersey Region are the Lower Passaic and Saddle; the Hackensack, Hudson, and Pascack; and the Arthur Kill. This map also shows the 12-digit HUC boundaries in the region, which are subsets of the watershed management areas. Areas within a single HUC-12 watershed boundary have interconnected water systems. This map illustrates that the watershed boundaries do not follow jurisdictional boundaries. The Northeastern New Jersey region is heavily urbanized, and the watershed boundaries have less significance in this region as compared to less dense areas, and the wastewater service areas shown in the previous map may have more implications for decision-making.

#### What is a Watershed?

A watershed can most easily be thought of as an area within which all rain that falls eventually flows to the same place. Watersheds can cross municipal and state boundaries – they do not obey lines on maps. Northeastern New Jersey has been heavily urbanized and has a lot of pavement and infrastructure that changes the flow of water. This has, in many ways, disrupted the natural and beneficial functions of its watersheds. That being said, the old watersheds still hold some influence over the flow of water and may be a valuable planning tool when considering ways to limit flood risk because they tell us where water "wants to go."

Watersheds can be mapped at a variety of scales, with smaller watersheds often combining into much larger watersheds. Watersheds in the United States are mostly mapped by the United States Geological Survey in units referred to as HUCs (Hydrologic Unit Codes). The lower the HUC number, the larger the watershed.

**Data Source:** NJGIN Open Data HUC 11 Watersheds Layer, NJDEP GIS Hydrography Open Data Watershed Management Areas Layer





### **OPEN & GREEN SPACE**

Hoboken, Bayonne, Newark, and Jersey City generally have less open space and parkland than other areas in New Jersey due to their urban nature. Nevertheless, based on estimates by the Trust for Public Land, more than 90% of the residents in all four cities live within a 10-minute walk to a park. Aside from several larger parks such as Liberty State Park, Weequahic Park in Newark, and Branch Brook Park in Newark, most parks cover single blocks or small areas. Several waterfront parks have recently been constructed or are in progress, as discussed in the **Planning Initiatives** section of this report, such as the Newark Riverfront Park and Crescent Park in Jersey City. Newark, in particular, lacks access to quality open spaces due to lapses in park maintenance, including for Weequahic and Branch Brook Parks. The Trust for Public Land has played a large role in improving open spaces in Newark in recent years and has funneled funding into the city to upgrade park facilities. Community gardens, which are valuable to many areas of the region that can be characterized as food deserts, are maintained by private or non-profit organizations in the region. For example, Jersey City and Newark each have over a dozen community gardens.

Access to open and green space is an important indicator of overall community health. Its impact on mental and physical health, as well as neighbors' relationships with one another, their community, and even crime, is extremely well documented. For example, in 2019, the International Journal of Environmental Research and Public Health cited twelve studies that had connected community gardens to a reduction in crime, including before and after comparisons (Shipley, 2019). An important element of resilience planning will be understanding how easily people in the region currently access open and green space, how they use that space, and how they might want it to change.

The region has been, like nearly everywhere else, in the grips of a global pandemic. The pandemic and the need for social distancing has likely changed how community members see the role of open space in their daily lives. Improved access to open space and reduced flood risk are often compatible objectives, and Resilient Northeastern New Jersey will be able to explore possible opportunities for coordination in communities experiencing both flood risk and limited access to open space.



**Data Source:** NJDEP Open Data Statewide Land Use Layer (2015), NJDEP Open Data Parks in New Jersey Layer, NJDEP Open Data Parks and Forest Trail System for NJ Layer, NJGIN State Local Nonprofit & Open Space Layer



### **HABITATS & CORRIDORS**

Despite the urban and industrial nature of the region, it is home to several endangered or protected species. For example, several areas in Jersey City and Newark are known habitats for urban peregrine. Habitat areas need to be protected through resilience measures to ensure the longevity of endangered or protected species. These species are often what are known as umbrella or keystone species, influencing the health of other species and the ecosystems we share.

GARWOOD Data Source: NJDEP Landscape v3.3 Data for Piedmont Plains Region of New Jersey



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#### LINCOLN PARK COMMUNITY GARDEN

Located in Newark's Lincoln Park neighborhood, this community garden offers residents fresh produce via their yearly CSA program. Image Source: City of Newark Press Office Although our region is interconnected and interdependent in many ways, and is unique in its diversity compared to the rest of the state, the four cities of Jersey City, Newark, Hoboken, and Bayonne are each very different and often operate independently. This chapter provides general information about each city's people, development, and economy.

Demographics, information about a city's people, provide a starting point for understanding the communities in our region, but this information does not paint a complete picture. Development trends in each city alert us to possible increased flood risk if we build in flood-prone areas in future years and provide insights into how the city is growing and changing. The largest industries and employers provide significant economic input into the region, and their vulnerabilities and risks will be evaluated in the risk assessment phase of this project.

# **04 - OUR COMMUNITIES**

### **JERSEY CITY**

Jersey City is the second most populous city and soon may overtake Newark as the largest city in New Jersey. Jersey City was ranked the most diverse U.S. city in 2020 in a ranking by WalletHub based on race and ethnicity, linguistic diversity, and birthplace diversity. Jersey City's location across the Hudson River from Lower Manhattan makes it home to many residents that commute into New York City using the PANYNJ PATH trains, NJ TRANSIT buses, the New York Waterway Ferry, and the Holland Tunnel. Downtown Jersey City is itself a large employment center, and many financial institutions have headquarters or offices in this area, with the NYC Financial District just a ferry ride away. Liberty State Park is located in southeast Jersey City, from where a ferry can be taken to the Statue of Liberty and Ellis Island.

#### Key facts about the people of Jersey City

#### **Population:** 261,746

#### Median Age: 34.2

#### Race and Ethnicity:

White: 35% Black or African American: 23.9% Asian: 25.1% Some Other Race: 12.1% Hispanic or Latinx (of any race): 29.1%

**Poverty Status:** 18.3% below poverty level (nearly double the State rate of 10.4%)

#### Total employment: 146,630

#### **Top industries** (by employment): commercial banking, investment banking, local government

Data Source: 2018 5-year ACS Data, 2018 IMPLAN data

#### **DEVELOPMENT TRENDS**

Construction in Jersey City has been booming in recent years. Between 2015 and 2019. Jersey City was the statewide leader in new housing production during this time and continues to have the highest rate of new development. This housing development is primarily concentrated in multi-family buildings. The areas of major development in Jersey City include Journal Square, Bergen-Lafavette, and Downtown, However, development in Downtown has slowed in recent years as the market matures. Additional emerging development areas, as identified in a study by GRID Real Estate in 2019, include Greenville, the western portion of Downtown, and the neighborhoods surrounding Journal Square. Details on the number of units recently built, approved, and proposed are included in the Appendix.

Jersey City's zoning and land use controls rely on redevelopment and rehabilitation plans with statutory authority. These plans are implemented by the Jersey City Redevelopment Agency, which was created in 1949. Jersey City has nearly 100 redevelopment or rehabilitation plans with statutory enforcement power that apply to areas where significant growth has and is projected to take place. Redevelopment plans for several areas located in or near current mapped special flood hazard areas are highlighted below, and additional plans are summarized in the Appendix.

#### **Enos Jones Redevelopment Plan**

The 2018 redevelopment plan for the area near Enos Jones Park, between Hamilton Park and I-78, is focused on increasing housing and retail and improving streetscapes. The plan includes green infrastructure requirements for developments in the area to improve stormwater management.

#### **Grand Jersey Redevelopment Plan**

The Grand Jersey Redevelopment Plan was initially adopted in 1993 but most recently amended in 2017. The area is located on the east side of Jersey City at Mill Creek, just north of Liberty State Park. The plan includes site remediation and the construction of Crescent Park, as well as provisions for a new light rail station. Although not directly included in the redevelopment plan, a stormwater storage tank will also be constructed upstream of the Mill Creek combined sewer outfall to mitigate flooding in the area.

#### **Bayfront Redevelopment Plan**

This redevelopment area is located along the Hackensack River, east of Route 440 and north of the Society Hill neighborhood. The plan, adopted in 2008, aimed to transform the formerly industrial area into a sustainable, mixed-income, mixed-use neighborhood with two linear parks running perpendicular to the Hackensack Riverwalk. According to Jersey Digs, Jersey City purchased the land in 2018 and began to initiate the construction process for housing development, including a portion of affordable housing, late in 2020.

The Plan envisions comprehensive redevelopment that includes a new street grid, linear and/or central parks, connection to the Hudson-Bergen Light Rail (HBLR), and development square intensity regulated by minimums and maximums as follow:

- Residential Minimum 4,200 units / Maximum 8,100 units
- Office Minimum 700,000 square feet / Maximum 1,000,000 square feet
- Retail Minimum 250,000 square feet / Maximum 600,000 square feet

#### **Canal Crossing Redevelopment Plan**

The Canal Crossing area is in the southeastern portion of the city between the Morris Canal and Claremont Industrial Redevelopment areas. The Hudson-Bergen Light Rail runs along the northern and eastern sides of the area. The area has an industrial history that has resulted in vacant and underutilized properties and site contamination. The Plan was most recently amended in 2020.

The plan envisions a New Urbanist neighborhood development that will provide a mix of uses and coexist with remaining industrial uses. Substantial new infrastructure improvements and a new street grid are envisioned as part of the redevelopment. The potential yield of the project is more than 7,000 new residential units with complementary commercial, institutional, and light industrial uses. Most of the area is within the floodplain.

#### JOBS AND MAJOR INDUSTRIES

According to 2018 data from IMPLAN, there are approximately 146,600 people employed in Jersey City across industry sectors. Some of the biggest employers in Jersey City are in various finance and insurance sectors, in addition to miscellaneous real estate and various local government services. Many of these same sectors account for much of Jersey City's annual economic output, with depository credit intermediation industries (e.g., commercial banks, savings institutions) and monetary authorities (i.e., Central Banks) accounting for \$4.1 billion of economic output alone.



#### **DOWNTOWN JERSEY CITY**

Located along the Hudson River waterfront, home to the offices of many financial institutions, including Goldman Sachs (tower to the left).

Image Source: edenpictures



OAK STREET PARK COMMUNITY GARDEN The Sherwood-Claremont community partnered with the City of Jersey City in the summer of 2020 to create a community garden in the Bergen-Lafayette neighborhood. *Image Source: Jersey City* 



LIBERTY STATE PARK

With the Statue of Liberty in the distance, the park's natural areas serve as habitats for local and migratory species. Image Source: Hudson County Division of Planning



PROTECTED BIKE LANE A group of families riding bikes in one of Jersey City's protected bike lanes, which were expanded in 2020. Image Source: Jersey City

### **NEWARK**

Newark in Essex County is the largest city in New Jersey with an estimated population of just over 280,000 people within a land area of just over 24 square miles. The decade between 2000 and 2010 was the first time since the 1950s when Newark saw an increase in population. Between 1920 and 1960, the city's population was over 400,000 before experiencing a precipitous decline from 1960 to 1990. Newark has the highest poverty rate of the municipalities in the Northeastern New Jersey region, with a 28-percent poverty rate based on 2018 5-year ACS estimates, and also has the most Black residents. As highlighted in **Our History**, racial discrimination and environmental justice issues have been a notable part of Newark's past.

#### Key facts about the people of Newark

#### **Population:** 280,463

#### Median Age: 33.7

#### Race and Ethnicity:

White: 26.1% Black or African American: 49.7% Asian: 2.1% Some Other Race: 19.1% Hispanic or Latinx (of any race): 36.4%

Poverty Status: 28% below poverty level

#### Total employment: 167,967

#### **Top industries** (by employment): air transportation, local government, miscellaneous food/drink

Data Source: 2018 5-year ACS Data, 2018 IMPLAN data

Newark was historically a heavily industrialized city. with associated environmental justice concerns including poor air quality and hazards from contaminated sites. Port Newark on the Newark Bay is part of the Port of New York and New Jersey and is the largest port on the east coast and the third largest port in the country. Portions of the port are within the FEMA mapped special flood hazard area, which is the area with a 1-percent or greater annual chance of flooding. Portions of Newark Liberty International Airport, which straddles the border between Newark and Elizabeth, are also in the mapped special flood hazard area. Other critical transportation systems in Newark include Newark Penn Station, Newark Broad Street Station, and a New Jersey Transit bus complex. Newark is home to regional utility systems such as the Essex County Resource Recovery Facility, the Passaic Valley Sewerage Commission Wastewater Treatment Plant. and the Essex County Resource Recovery Facility (Covanta Essex).

#### **DEVELOPMENT TRENDS**

Based on records for building permits and certificates of occupancy, development activity in Newark has slowed slightly in recent years. As in Jersey City, the majority of residential development has been in multi-family buildings. Development activity in Newark could surge in the coming years based on site plan approval records in recent years, though potential long-term impacts on development from the pandemic will not be clear for some time.

Between 2015 and 2019, 2,160 new housing units received certificates of occupancy per the New Jersey Department of Community Affiars (DCA) Construction Reporter. Of those, 178 were in oneand two-family dwellings, 279 were in mixed-use projects, and 1,703 were in multi-family buildings. The DCA records include three-family residences, which are one of the most common and popular development types throughout large portions of the city within the multi-family category. From the Beginning of 2016 to September 30, 2020, 1,804 building permits were issued. Certificates of occupancy lag behind building permits by one or more years depending on the scale of construction, so the actual development activity in the city has slowed slightly in recent years. Nevertheless, a significant amount of new development has received site plan approval from the City's Central Planning Board and Zoning Board of Adjustment during the same time period. These pending developments could lead to more development activity in a short period of time.

Land use in the City of Newark is regulated by 19 zoning districts and approximately 15 redevelopment areas. There are nine zoning districts and one redevelopment area within mapped special flood hazard area (1-percent annual chance or greater of flooding) and the areas FEMA idenitfies as having a 0.2-percent annual chance of flooding. These maps show FEMA's current estimated risk of coastal and riverine flooding, but do not address all flood hazards.

Newark's River Public Access and Redevelopment Plan (River Redevelopment Plan) regulates land use along the Passaic River in the northern portion of the Ironbound and wraps along the river to the west and north through the City's Downtown and into the North Ward. The districts within the River Redevelopment Plan range from low-rise residential to mixed-use, to industrial with standards fairly consistent with the standard zoning. The Mixed Use 2 and Mixed Use 3 Districts in the Plan permit mixed-use and residential development up to 25 and 40 stories in height. Portions of these mixed use districts are within the current FEMA mapped special flood hazard area.

One of the most important components of the River Redevelopment Plan is the development of the riverfront walkway, several stages of which have been completed. Planning and design for future stages of the walkway continue, with the goal of eventually wrapping along the Passaic River from the Ironbound in the southeast through Downtown, and into the Lower Broadway neighborhood in the North Ward. Recent development activity in the Ironbound Neighborhood has included a new hotel, mixed-use and residential buildings up to 5 or 6 stories in height, and smaller infill development. The City Boards have approved several residential towers downtown to the west of the Ironbound, but these future developments are generally well outside the flood hazard area.

The Living Downtown Redevelopment Plan was adopted in 2008 with the goal of transforming downtown Newark into a "24-hour district" with a mix of uses and an influx of new residential development. The objectives of the plan were to eliminate zoning controls that were hindering development and redevelopment, and provide new use and design regulations that would spur new development.

The plan includes some areas near, but not immediately adjacent to, the Passaic River. The plan is permissive with limited bulk and use controls; most notably no maximum height or density requirements.

The Port and Heavy Industrial (I-3) Zones in Newark's East Ward near the Passic River are largely within mapped special flood hazard areas. The area is also characterized by significant amounts of historic fill and environmental contamination. The City of Newark is working with a consultant team to prepare a new redevelopment plan for the Doremus Avenue Area that encompasses much of the I-3 Zone that is largely within the mapped special flood hazard area.

#### JOBS AND MAJOR INDUSTRIES

According to 2018 data from IMPLAN, there are approximately 168,000 people employed in Newark across industry sectors. Significantly, the air transportation industry provides more jobs and produces more annual economic output than any other industry in Newark by a wide margin-more than double any other industry sector in the city. Other prominent industry sectors in Newark are local public education and government services, hospitals, finance, insurance, and scenic and sightseeing transportation.



**RABBIT HOLE FARM** 

Students gardening at an event co-hosted by Newark's Office of Sustainability and the NJ Tree Foundation for students in 2017, joined by Mayor Ras Baraka.

Image Source: City of Newark Press Office



#### **COMPOSTING DEMONSTRATION** SWAG Project, an urban farm, food justice, and community building project based in Newark's South Ward, giving a demonstration at the Lincoln Park Music Festival.

Image Source: City of Newark Press Office



A prominent feature along the Newark Bay that is crucial for the economy of the region.

Image Source: Ken Lund



FLOODED STREETS Shallow street flooding in low-lying areas. Image Source: City of Newark Press Office

### HOBOKEN

Hoboken, often referred to as the "Mile Square City," is a small but densely populated city north of Jersey City. With a poverty rate similar to the statewide average, Hoboken has the lowest poverty rate of the four cities, has the highest property values in Northeastern New Jersey, and has more municipal resources per capita than the other municipalities as a result. Hoboken is majority white and has the smallest minority population of the four municipalities in the region. Hoboken experiences chronic flooding in areas of the city associated with the combined sewer system, but the city has been taking steps to address this flooding in recent years. Hoboken prides itself on being walkable, and it relies on public transportation systems, such as NJ TRASNIT rail and buses through the Hoboken Terminal, PATH trains to Manhattan, Hudson-Bergen Light Rail along the western side of Hoboken, the NY Waterway Ferry, and the Hoboken Hop shuttle for residents.

#### Key facts about the people of Hoboken

#### Population: 53,211

#### Median Age: 32.0

#### Race and Ethnicity:

White: 82.3% Black or African American: 3.1% Asian: 9.1% Some Other Race: 2.1% Hispanic or Latinx (of any race): 15.8%

Poverty Status: 9.1% below poverty level

#### Total employment: 37,084

**Top industries** (by employment): transit, educational services, full-service restaurants

Data Source: 2018 5-year ACS Data, 2018 IMPLAN data

#### **DEVELOPMENT TRENDS**

Hoboken has approximately 1.25 square miles of land area and is mostly built out. New development in the City will involve the continuation of ongoing redevelopment projects to reimagine historic industrial areas and further development near the waterfront and Hoboken Terminal. In addition, the Hoboken Housing Authority is beginning the process of studying opportunities to redevelop its properties in a way that better integrates with and strengthens connections to the rest of the City.

The city has seen its population increase substantially since its 20th century nadir in the late 1980s and early 1990s. In 2010, the population was 50,005, which represented a nearly 30-percent increase from 2000. The 2019 American Community Survey estimated about 5-percent growth to approximately 52,677 since 2010. The City's population remains below its historic high of 70,324 in 1910.

Hoboken is largely residential, but development in recent years has included office and commercial space in addition to residential. Over the last five years, over 1,150 new multi-family units and 20 new one- and two-family units have received certificates of occupancy. Building permit data indicates that there are several hundred additional approved units in the development pipeline.

The most significant new residential development is the "7 Seventy House" at 700 Jackson Street, which contains 424 rental units. A major expansion of the Stevens Institute of Technology campus consisting of two towers intended to provide housing for over 1,000 students is under development. In recent years, commercial development has been limited primarily to ground floor space in mixed use buildings. A forthcoming phase of the Maxwell Place project includes new office space that will be the most significant new commercial development in the City in recent years. Specific development information included in the April 2020 Hudson County Hazard Mitigation Plan indicates that 33 projects consisting of approximately 2,100 residential units, a new hotel, and over 200,000 square feet of retail or commercial space were approved, under construction, or otherwise pending. Nearly all of these projects are within the FEMA mapped special flood hazard area.

Land development in Hoboken is regulated by 13 zoning districts and 9 redevelopment / rehabilitation plans. Since nearly the entire city is within the floodplain, almost every zone and plan is, as well. Growth is targeted in designated Redevelopment Areas concentrated in the north and west part of the city and along the city's southern edge, including the waterfront area near Hoboken Terminal. Redevelopment plans for several areas located in or near current mapped special flood hazard areas are highlighted below, and additional plans are summarized in the Appendix.

#### Department of Public Works (DPW) Redevelopment

The DPW Redevelopment Area in southern Hoboken envisions a mixed-use development consisting of multi-family residential units and complementary commercial uses with up to 240 dwelling units and 15,000 square feet of non-residential space.

#### Hoboken Yard Redevelopment

The Hoboken Yard Redevelopment envisions a transit-oriented, commercially anchored, mixed-use development around the Hoboken Terminal. The Plan envisions new office space and commercial uses within walking distance of the train station. Infrastructure improvements to address flooding, circulation, pedestrian safety, sustainability, and resilience are an integral part of the Plan. Build out of the Redevelopment Area will consist of between 1 and 1.3 million square feet of office, retail, and parking across three development sites over several phases.

#### **Neumann Leathers Rehabilitation Area**

The Neumann Leathers Rehabilitation Plan encompasses an industrial complex along Hoboken's southern edge that dates to the mid-1800s. The purpose of the Plan is to facilitate the rehabilitation of the complex into a neighborhood hub with a mix of light industrial and industrial arts uses complemented by new residential and commercial development. A maximum of 380,000 square feet of development and 210 dwelling units are permitted in the Plan.

#### Northwest Redevelopment

The Northwest Redevelopment Plan dates to the late 1990s with a redevelopment designation based on the deterioration of industrial activity in this part of the City and the declining contributions to the tax base. The permitted uses are principally light industrial, office/research, and large scale commercial uses supplemented by residential development in certain locations. Development intensity is controlled by a maximum height of 60 feet and floor area ratio limits ranging from 2.4 to 3.0.

#### Post Office Rehabilitation Area

The Post Office Rehabilitation Area encompasses the historic Post Office and adjacent land. The goal of the Plan is to preserve and retain the Post Office while permitting the development of a new hotel on the adjacent parcel near the waterfront and train station.

#### JOBS AND MAJOR INDUSTRIES

According to 2018 data from IMPLAN, there are approximately 37,100 people employed in Hoboken across industry sectors. Many of Hoboken's largest employers are in the transportation, educational, and food and beverage service industry sectors. In addition to other industry sectors which commonly account for much of a municipality's annual economic output throughout the region, such as real estate, finance, and insurance, publishing is a major industry in Hoboken by annual economic output–inclusive of directory, mailing list, book, and software publishers.



**GREEN INFRASTRUCTURE AT CITY HALL** 

The demonstration project includes rain gardens, cisterns, porous concrete, and a green wall, and can capture rainwater from a 25-year storm.

Image Source: Mayor of Hoboken Facebook Page



#### HOBOKEN TERMINAL

A multi-modal transit station with NJ TRANSIT trains and buses, PANYNJ PATH trains, and ferries, among other transportation lines.

Image Source: City of Hoboken



**COMMUNITY RESILIENCE** Hoboken residents sharing power to charge devices after Hurricane Sandy.

Image Source: City of Hoboken



ARTS & MUSIC FESTIVAL A lively bi-annual festival celebrating food and culture. Image Source: City of Hoboken

### BAYONNE

Bayonne is situated on a peninsula south of Jersev City with approximately 5.8 square miles of land area, and it is connected to Staten Island by the Bayonne Bridge (Route 440) at Bergen Point. Bayonne largely retains a "small town" feel according to some who live there, yet is heavily industrialized along the Upper New York Bay and Kill Van Kull. The industrial Constable Hook area in the southeastern portion of the city, which is almost entirely within FEMA mapped 1-percent or 0.2-percent chance flood hazard areas, has large petroleum storage facilities, energy production and logistics operations. Bayonne is also home to commercial shipping ports and the Cape Liberty Cruise Port, one of three passenger cruise terminals that are part of the Port of New York and New Jersey. The perimeter of the city along the waterfront is directly impacted by flood hazards, while the central portion sits at higher ground.

#### Key facts about the people of Bayonne

#### **Population:** 65,300

#### Median Age: 38.0

#### Race and Ethnicity:

White: 82.3% Black or African American: 3.1% Asian: 9.1% Some Other Race: 2.1% Hispanic or Latinx (of any race): 15.8%

#### Poverty Status: 13.8% below poverty level

#### Total employment: 23,941

**Top industries** (by employment): local government, hospitals, warehousing and storage

Data Source: 2018 5-year ACS Data, 2018 IMPLAN data

#### DEVELOPMENT TRENDS

Bayonne's population has grown slightly over the last two decades after over 60 years of declining population attributed to loss of industrial and military iobs. The current estimated population of just over 65,000 is well below the city's peak of 88,979 in 1930.

The loss of many of Bayonne's industrial and military facilities in the late 20th century resulted in several hundred acres of vacant and/or underutilized waterfront land. The City of Bayonne, working in cooperation with investors and state and federal governments, has promoted a robust redevelopment of these properties that has substantially increased Bayonne's population, contributed to a more stable tax rateable base, and re-introduced Bayonne's residents to the waterfront via public walkways and parks. Waterfront redevelopment, much of which lies in special flood hazard areas, continues to occur with major projects planned or under construction at the former Military Ocean Terminal (MOTBY), Exxon, Texaco, Caschem, and Bavview (A&P) sites. Infill and transit-oriented redevelopment also continues to occur throughout Bayonne and particularly in areas serviced by the Hudson-Bergen Light Rail.

Based on building permit records, housing construction in Bayonne has been accelerating in recent years, with over 3,000 new housing units authorized from 2017 through September of 2020. New construction has been mostly multi-family, similar to the other cities in the region. Certificate of occupancy data, which tend to lag by several years behind building permit records, show that 145 new housing units were certified in 2018 and 445 were certified in 2019. Recent approvals support the fact that the multi-family construction trend in Bayonne remains strong.

Land development in Bayonne is regulated by 19 zoning districts and over a hundred redevelopment plans. The following sections highlight several of Bayonne's major adopted waterfront redevelopment

plans that remain active and are either under construction or proposed to be constructed in the next several years. All of Bayonne's waterfront redevelopment plans require that the redevelopers consider applicable regulations for flood protection and public access to the waterfront.

#### Peninsula at Bayonne Harbor **Redevelopment Plan**

The Peninsula at Bayonne Harbor Redevelopment Plan and associated "district-specific" plans govern redevelopment of the former Military Ocean Terminal at Bayonne (MOTBY), which was transferred from the US Army to the City of Bayonne in 2001. The approximately 430-acre area is almost entirely located within the FEMA-designated 1 percent chance annual floodplain. Overall, the plan calls for the eventual build-out of several thousand residential units, new warehousing and light industrial space, and non-residential space including office, retail, cultural and enterainment, and civic space on the western half (approximately) of the property. Open space, including a portion of the Hudson River Waterfront Walkway, is also a major component of the intended vision and build-out. The Port Authority of New York and New Jersey owns the eastern half of MOTBY, where the Cape Liberty Cruise Port and Bayonne Dry Dock operate.

Since 2008, several sections of the peninsula's plan have been superseded and amended. The Harbor Station South Redevelopment Plan, adopted in 2015, covers the southwest section of the peninsula near where it meets Route 440, and a new Costco and 97unit residential building were recently constructed in this area. In 2020, another amendment to the peninsula's plan increased the size of the Maritime District and reduced the size of the Landing and Loft Districts. This shift brings more of the peninsula area into the industrial, warehousing, and port operations land use category, and less of it in the residential and mixed use category.

#### **Texaco Redevlopment Plan**

The Texaco Redevelopment Area is located on the southwestern tip of the city between the Newark Bay and the base of the Bayonne Bridge, and is the site of the former Texaco refinery. which has been demolished. The area's plan was adopted in 2015, and amended in 2019 and 2020, with the current version including film studios, sound stages, and typical ancillary uses to movie production on the list of principal uses. Other permitted uses include a hotel, marina. arena, residences, offices, restaurants, and neighborhood-scale commercial uses.

of ferry service.

\*Additional plans are summarized in the Appendix

#### JOBS AND MAJOR INDUSTRIES

According to 2018 data from IMPLAN, there are approximately 23,900 people employed in Bayonne across industry sectors. Many of Bayonne's largest employers are in the local public education and government services. hospitals, warehousing and storage, and food and beverage services and retail industries. In addition to the industry sectors of owner- and tenant-occupied housing, hospitals, finance, and real estate, Bayonne is home to several manufacturing industries that play a large role in its economic output. Petroleum lubricating oil and grease manufacturing and spice and extract manufacturing, both account for much of Bayonne's annual economic output.

A waterfront walkway along the perimeter of the area abutting the Kill Van Kull and Newark Bay is required with a minimum public access width of 30 feet and a minimum developed walkway width of 16 feet. A new roadway network is anticipated through the area, along with bicycle and pedestrian infrastructure, and establishment



**STEPHEN R. GREGG PARK** Located on Newark Bay, this Hudson County park has recreation facilities, fishing piers and a waterfront promenade. Image Source: Hudson County Division of Planning



**RICHARD A. RUTKOWSKI PARK** A view of the Newark Bay Bridge (I-78) from park wetlands.

Image Source: Hudson County Division of Planning



BULK STORAGE FACILITIES

A view of the sprawling facilities from the Upper New York Bay looking west. Image Source: gcaptain



THE HACKENSACK RIVERWALK Portion of the walkway in Richard A. Rutkowski Park. Image Source: Hudson County Division of Planning

Resilient Northeastern New Jersey will develop a roadmap for implementation of flood-related resilience measures for the region to address current and future flood risks and also improve quality of life. As a regional plan set in a context of ongoing efforts to reduce risk locally, the roadmap is expected to advance or complement initiatives already underway or completed, but never supplant, disrupt, or duplicate them. Many initiatives have been led by local, state, federal, or regional infrastructure entities. One goal of the Resilient Northeastern New Jersey project is to form partnerships that do not already exist so that solutions can be implemented at appropriate scales, honoring interdependencies.

The Consultant Team coordinated with the Northeastern New Jersey Steering Committee to conduct a review of ongoing resilience-related planning initiatives and projects in the region, as well as statewide initiatives. This chapter includes findings of the review and highlights several major initiatives and projects expected to alter the social and risk landscapes of our region.

#### NEWARK RIVERFRONT PARK OCTOBER 2017 PHASE 4 GROUNDBREAKING

Newark Riverfront Park runs several miles along the Passaic River. The park is being constructed in phases and encompasses many former brownfield sites.

Image Source: City of Newark Press Office

ADSTI

## **05 - PLANNING INITIATIVES**

### **RESILIENCE BUILDING –** A SHARED RESPONSIBILITY

Resilience is a shared responsibility across all levels of government, all sectors, and all scales of community, from household to nation. Government decisions around land use and floodplain management are subject to a hierarchy of rules and regulations at multiple scales – local, state, and federal. As a "home rule state," local municipalities in New Jersey have considerable freedom to develop and implement policies that best serve local needs. Local municipalities are subject to federal and state laws and guidance on construction, environmental impacts, and evaluating climate risk. With resilience layered in at multiple levels of government, this can be a confusing web to navigate, particularly when these layers are not in perfect alignment or outright conflict. The table below outlines major responsibilities at four scales of government. The following sections provide additional detail on major initiatives at the state level and within each city in the region.

- The U.S. Army Corps of Engineers (USACE) conducts flood risk reduction studies and implements flood risk reduction projects. Several of these projects are highlighted in later sections of this chapter.

#### **FEDERAL**

#### STATE

#### The Federal Emergency Management Agency (FEMA) creates maps of flood risk and sets national floodplain construction standards

 FEMA also administers the National Flood Insurance Program (NFIP), through which people in participating municipalities can purchase **flood insurance**. Reduced rates are available for municipalities that adopt higher construction standards through the Community Rating System (CRS). Currently, none of the cities in the Northeastern New Jersey Region participate in the Community Rating System

 FEMA also provides hazard mitigation and disaster recovery funding. To be eligible for hazard mitigation funds, states and local entities must develop a Hazard Mitigation Plan (HMP). Jersey City, Hoboken, and Bayonne participated in the recent 2020 update to the Hudson County HMP, and Newark participated in the 2020 update to the Essex County HMP.

#### • The National Oceanic and Atmospheric Administration (NOAA) manages the federal Coastal Zone Management Program.

 Additional federal agencies and offices are involved in setting policy on climate change and implementing environmental regulations, as well as collecting data and information that is valuable in understanding and addressing flood risk. These include the EPA. USGS. USFWS, and others. Coordinated data gathering, sharing, monitoring, and upkeep of this information is an important goal to pursue to improve our ability to increase resilience.

- NJ Dept. of Environmental Protection (NJDEP) coordinates federal, state, and local floodplain management programs, which includes statewide floodplain construction standards and model local ordinances.
- NJDEP is leading development of statewide climate resilience planning initiatives, including Resilient NJ.
- NJDEP administers the Blue Acres program that purchases flood-prone **properties** and preserves them as open space.
- State law requires municipalities to develop **master plans** that guide growth and change in the community. State law also requires counties to develop county master plans under the County Planning Act.
- Coordination with federal programs (NJDEP coordinates with USACE: and NJ Office of Emergency Management (NJOEM) coordinates with FEMA on hazard mitigation and disaster recovery fundina).
- New Jersey Department of Community Affairs (NJDCA) enforces construction codes and administers the Community Development Block Grant (CDBG) funds received by the State for Hurricane Sandy assistance.
- New Jersey Board of Public Utilities (NJBPU) regulates utilities, including water supply and wastewater management.
- NJDEP implements environmental regulations (wetlands, stormwater, brownfields, etc.) and administers the state Coastal Zone Management Program.

- Counties are responsible for managing their own roads, infrastructure, parks and utility authorities and can adopt Land **Development Standards** as development impacts their assets.
- Hudson and Essex Counties have adopted Hazard Mitigation Plans.
- Regional water utilities are responsible for water supply, wastewater treatment, and development of Long-Term **Control Plans** to mitigate impacts on water quality.
- Regional energy utilities and transportation infrastructure agencies have advanced their own planning for climate risks and implementation of flood mitigation projects.

 As a home rule state. land use, zoning, and development regulations rest in the hands of local decision makers.

LOCAL

- Municipalities are required to have a Flood Damage Prevention Ordinance
- Municipalities must adopt a Master Plan that meets statewide requirements
- Municipalities develop capital improvement programs to address infrastructure needs.
- Municipalities contribute to county-level hazard mitigation plans to address multiple hazards, including flooding.
- Municipalities submit grant applications to support fundina.
- Municipalities are able to raise funding for implementation through property taxes, municipal bonds, and improvements associated with redevelopment projects.

#### **COUNTY/REGIONAL**

### **STATEWIDE INITIATIVES**

Under the administration of Governor Phil Murphy, New Jersey has taken a proactive approach in preparing for climate change by introducing Executive Orders that create new statewide planning and policy mechanisms and require municipalities to consider climate change and resilience in their statemandated master planning processes.

- Executive Order 89 requires the state to develop a Statewide Climate Change Resiliency Strategy and created an Interagency Council on Climate Resilience. As part of the strategy, the State is developing a Coastal Resilience **Plan** to address issues specific to New Jersey's coastal zone.
- Executive Order 100 launched New Jersey Protecting Against Climate Threats (NJPACT), an initiative aimed at modernizing land use requirements to incorporate climate change. The EO directed NJDEP to identify specific rules, guidance documents and other regulatory mechanisms to revise by integrating climate change considerations, including seal level rise. Administrative Order 2020-01 implements EO 100 and set deadlines for NJDEP rule changes. including the Coastal Zone Management Rules, Freshwater Wetlands Rules, Flood Hazard Control Act Rules, and Stormwater Management Rules. It also instituted a Chief Resilience Officer and Bureau of Climate and Flood Resilience.
- New legislation passed in February 2020 (NJ) Assembly Bill 2785 / NJ State Senate Bill 2607) requires the land use plan element of municipal master plans to include climate change-related hazard vulnerability assessments. Municipalities are required to maintain and update a master plan, and this new bill brings resilience to the forefront of those plans so that resilience is addressed not only at the State scale, but at local

levels, as well.

- · The State has also began tackling its legacy of pollution and environmental racism through the Environmental Justice Bill (S232, September 2020). The bill states that if companies want to build a new facility, expand an existing facility, or renew a permit for an existing facility's major source of pollution in an "overburdened community," it must be reviewed by NJDEP. The rule applies to various facilities, including waste transfer stations and large sewage treatment plants. It defined overburdened communities as those where 35% of households are low income, 40% of residents are minority, or 40% of households have limited English proficiency (LEP).
- The New Jersey Department of Environmental Protection (NJDEP) initiated a regulatory program in 2015 requiring utilities operating combined sewer systems to develop Long-Term Control Plans (LTCP) that identify projects to be implemented in the coming decades to reduce combined sewer overflows. As described in the Our Region section, combined sewer systems carry both wastewater from homes and businesses and stormwater from rainfall in the same pipe network, and these systems often release combined sewage (wastewater and stormwater) into bodies of water when it rains. The primary goal of the Long-Term Control Plans is to improve water quality in New Jersey's waters by preventing discharge of combined sewage through measures such as large underground stormwater storage tanks or tunnels, green infrastructure, or capacity improvements. These projects also have the potential to reduce flooding associated with rainfall by providing spaces for stormwater to flow. The Long-Term Control Plans produce additional opportunities for communities through the implementation of green infrastructure, which can have environmental benefits, and creation of

park space over stormwater storage tanks. The utility providers that own or operate the sewer systems in our region, including the Jersey City Municipal Utilities Authority (JCMUA), North Hudson Sewerage Authority (NHSA), Suez, the City of Newark, and the Passaic Valley Sewerage Commission (PVSC), each contributed to submit reports in 2020 that outlined schedules and cost estimates for implementation of potential projects, and it is clear from these estimates that the Long-Term Control Plans will be large financial burdens to the utilities and the communities they serve. More information about the Long-Term Control Plans and the various submittals by utilities can be found on the NJDEP website at https://www. nj.gov/dep/dwq/cso.htm, and in the following sections of this report

### **PROJECT PROFILES PSE&G ENERGY STRONG**

PSE&G is the gas and electric utility that serves the four cities in Hurricane Sandy. PSE&G initiated the Energy Strong program in 2014 to elevate, harden, or replace at-risk electrical substations and make other system improvements to prevent future power outages. As part of PSE&G Energy Strong, PSE&G is coordinating with the City of Hoboken to combine the Marshall and Madison Street Substations in Hoboken into one elevated Expanded Madison Street Substation above the floodplain. The Expanded Madison Street Substation was designed to complement the surrounding architecture of northwest Hoboken. The new substation was constructed and fully operational as of Fall of 2020, with remaining sitework expected to be complete in March of 2021.

St. Substation to be constructed

Source: Hoboken Master Pla

More information about the PSE&G Energy Strong program can be found at https://nj.pseg.com/safetyandreliability/reliability/ currentinitiatives/makingnewjersevenergystrong, and information about the Hoboken substation project can be found at https://www. psegtransmission.com/reliability-projects/69kv-initiative/town/hoboken



Rendering of elevated Madison

### **USACE NYNJHAT STUDY**

Following Hurricane Sandy, the USACE initiated the New York-New Jersey Harbor and Tributaries (NYNJHAT) Coastal Storm Risk Management Feasibility Study to and New Jersey. The NYNJHAT February 2019 Interim Report presented existing information and assumptions, identified gaps, and presented initial conceptual alternatives to address coastal resilience in the region. Four alternatives were evaluated that each included a system of physical barriers (floodwalls, levees, gates, etc.) to protect portions of the area between Sandy Hook, NJ and Breezy Point, NY. The alternatives were each proposed to include nonstructural measures as needed or feasible to promote resilience such as land acquisition, land use planning and zoning changes, and building retrofits. The proposed alternatives were estimated to protect portions of the study area from coastal hazards, ranging from 3 percent of land area protected to 95 percent of land area protected; however, the alternatives would largely not address rainfall-related flooding in the area.

Although the NYNJHAT Study alternatives were centered around physical barriers, workshops with government and agency representatives indicated nature-based solutions were preferred over hard solutions, and highlighted concerns about environmental impacts of structural measures. The report also indicated that further modeling would be needed to evaluate the potential for induced flooding to neighboring areas resulting from surge gate deployment.

As of April of 2020, funding for the NYNJHAT Study had been suspended and project activities were postponed. More information about the NYNJHAT Study can be found at https://www.nan.usace.army.mil/Missions/Civil-Works/Projects-in-New-York/New-York-New-Jersey-Harbor-Tributaries-Focus-Area-Feasibility-Study/

#### PANYNJ PATH STATION HARDENING

The PATH trains, which are owned and operated by the Port Authority of NY and NJ (PANYNJ), connect Hoboken, Jersey City, Newark, and New York City, and are a key transportation system in the region. During Hurricane Sandy, many of the underground PATH stations were inundated with floodwaters, causing severe disruption of service. Since Hurricane Sandy, PANYNJ has undertaken hardening of the Hoboken PATH Station and the Exchange Place, Grove Street, and Newport PATH stations in Jersey City. The improvements to the Hoboken PATH station were mostly completed in 2020 and included installation of barriers to seal off the staircases during storms and steel doors to protect the tracks. More information about the Hoboken PATH Station hardening can be found at https://www.panynj.gov/port-authority/en/blogs/rail/ recovered-from-sandy--hoboken-path-set-to-weather-the-next-storm.html

### **JERSEY CITY**

Jersey City's comprehensive resilience planning has included a citywide risk and vulnerability assessment, the identification of priority areas, and the recommendation of projects to address resilience in those priority areas.

- In 2014, following Hurricane Sandy, Jersey City prepared the **Sandy Recovery Strategic** Planning Report to document damages from the storm, evaluate the city's vulnerabilities, and draft a strategic action plan.
- In 2015, Michael Baker International prepared the Visualizations of Adaptation Scenarios and Next Steps White Paper ("Baker Report") to present resiliency scenarios for Jersey City; this paper built off of work done by the

Collaborative Climate Adaptation for Urban Coastal Flooding study team, which was a partnership between Jersey City and Stevens Institute of Technology.

- The scenarios from the Baker Report were further developed by the City of Jersey City in the 2017 Resiliency Master Plan, Adaptation Master Plan, and Urban Environmental Green Infrastructure Plan, which established Jersey City's resilience visions and goals and outlined projects for six priority areas across the city. The recommended projects involve elevation of roadways, levees, berms, and floodwalls at various locations, as well as additional engineering analyses to further advance understanding of risk. These projects have not vet been advanced past the conceptual levels.
- Jersey City also published a Resilient Design **Handbook** in 2018, which aimed to provide information to residents and businesses in Jersey City about green infrastructure and resilient building design to encourage smallscale resilience measures throughout the city.
- The City has also developed a flood overlay **zone** to promote resilience, which is described in more detail on this page.
- The 2020 Jersey City Municipal Utilities Authority (JCMUA) Long-Term Control Plan for combined sewer overflows proposed a phased approach for achieving reduced overflow volumes, beginning with implementation of green infrastructure and sewer rehabilitation projects, followed by construction of five stormwater storage tanks.

and neighborhood levels.

- infrastructure installments.

### **PROJECT PROFILE FLOOD OVERLAY ZONE**

The Jersey City Flood Overlay Zone Ordinance establishes the "F" Overlay that applies to all properties in the city that are located in whole or part within the designated AE or VE flood zones as depicted on official FEMA Flood Insurance Rate Maps (FIRMs) or Preliminary Flood Insurance Rate Maps (PFIRMs). The "F" Overlay does not alter the use standards of the underlying zone or redevelopment plan, but includes additional bulk requirements associated with green

Green Area Ratio (GAR) is a concept introduced in the Ordinance that requires the use of green infrastructure and resilient design in site plan applications in "F" Overlay zones. GAR is calculated using a multipliers table established in the Ordinance that assigns weights to different types of landscaping, green infrastructure and building elements (vegetated walls, green roof, permeable pavement, bioretention, WaterSense fixtures, etc). Projects in the AE zone are required to have a GAR of 0.25 and projects in the VE zone are required to have a GAR of 0.50.

The Flood Overlay Zone and Green Area Ratio concept are creative policies that mandate enhanced non-structural stormwater management, landscaping for resiliency, and green infrastructure elements within the parts of the city most vulnerable to flood hazards.

### NEWARK

Resiliency planning in Newark has been led by a variety of players, including at the federal, municipal,

• Newark's 2013 Sustainability Action Plan, which supplemented the City's Master Plan, provided a vision for a sustainable Newark and included a stormwater chapter that established goals for implementing green infrastructure in the city.

• In 2015, the Ironbound Community Corporation and American Planning Association – New Jersey Chapter prepared the **South Ironbound Resiliency Action Plan** that presented recommendations for policy, planning, capacitybuilding, and physical actions to improve resilience in the South Ironbound neighborhood, which experiences chronic rainfall-related flooding.

 In 2017. Rutgers prepared a Coastal Vulnerability Assessment for Newark with funding through the Hurricane Sandy Coastal Resiliency Competitive Grant Program (a program through the National Fish and Wildlife Foundation); the vulnerability assessment focused on the riverfront area of the Passaic River in downtown Newark.

 Rutgers also prepared a Green Infrastructure **Feasibility Study** for Newark, which identified suitable locations for various types of green

• The City of Newark participated in the 2020 update to the Essex County Hazard Mitigation Plan, which was led by the Essex County Sheriff's Office.

 Newark's 2020 Long-Term Control Plan for combined sewer overflows proposed several options depending on Newark's ability to send additional sewage flow to the Passaic Valley Sewerage Commission (PVSC) wastewater treatment plant. The projects proposed in the various options included operational changes, construction of stormwater storage tanks, green infrastructure, and water conservation measures to decrease the amount of wastewater entering the system.

### **PROJECT PROFILE USACE PROJECTS IN NEWARK**



USACF bulkhead construction in Newark Riverfront Park (view from north of Center St, looking south). Source: https://www.usace.armv.mil/Media/News-Archive/Story-Article-View/Article/2413454/army-corps-project-revitalizes-economy-of-new-jerseys-largest-city/

The United States Army Corps of Engineers (USACE) and (NJDEP) are leading several ongoing projects focused on Newark and the Passaic River. The Joseph G. Minish Passaic River Waterfront Park and Historic Area project, also known as the Newark Riverfront Park, involved phased construction of bulkheads and a riverfront park with berms along the Passaic River. USACE began constructing the bulkheads in 1999, with completion of bulkhead construction anticipated in 2022; these bulkheads will stabilize the banks of the Passaic River. Park construction was undertaken by the City of Newark and the Trust for Public Land, with portions completed in 2016. More information about this project can be found at https://www.nan.usace.army.mil/ Media/Fact-Sheets/

The USACE Passaic River Tidal Protection Area project. also referred to as the Newark Flanking Plan, is a proposed

flooding. As of 2019, the recommended plan involves a total of 4,850 linear feet of floodwalls, levees, and road and railroad closure structures. Detailed design was initiated in August 2019, and the first construction contract is scheduled for award in November of 2021, with the goal for construction completion by the end of 2022. The figure below shows the proposed locations of floodwalls, levees, and road closure structures in red and shows the projected floodplain with water elevation at 14-feet NAVD88 after implementation of the project. More information about the Newark Flanking Plan can be found in the USACE Final Integrated Hurricane Sandy General Reevaluation Report

The USACE is also leading the Passaic River Basin General Reevaluation Study to evaluate structura and non-structural flood management projects to mitigate flooding along the Passaic River, including Newark and the areas upstream. A Preliminary Alternative Analysis Report was prepared in 2013 and updated in 2017, which considered alternativ such as a water diversion tunnel from Wayne, NJ to the Newark Bay, floodproofing measures, elevation of infrastructure, and buyout programs. More information about the General Reevaluation Study can be found at https://www.nan.usace.army.mil/ Media/Fact-Sheets/

Recommended Newark Flanking Pla Source: USACE Final Integrated Hurricane Sandy Gener Reevaluation Report and Environmental Assessmer



### HOBOKEN

In the last decade, Hoboken has been a regional and national leader in coastal and stormwater resilience. Hoboken has had strong municipal leadership in performing comprehensive resilience planning by incorporating sustainability and resilience principles into existing municipal planning processes. Leadership in seeking funding for projects and in creating partnerships with other entities has allowed for successful implementation of projects identified through planning initiatives. A summary of resilience-related plans that have been developed by Hoboken is provided here:

- Soon after Hurricane Sandy, Hoboken developed the **Hoboken Resiliency and Readiness Plan** that outlined goals and actions for preventing future damage similar to what occurred during Hurricane Sandy. Many of the actions identified in the Resiliency and Readiness Plan have already been implemented or are in progress, such as the various resilience parks around the city that incorporate green infrastructure and storage to mitigate stormwater flooding.
- Hoboken also prepared a **Green Infrastructure Strategic Plan** in 2013 that, through public participation and expert analysis, identified floodprone areas in the city and developed a strategy for implementing green infrastructure across the city to best mitigate stormwater flooding.
- In 2015, Hoboken published the Resilient Building Design Guidelines to outline requirements for construction within flood hazard areas and to provide guidance for best practices to residents, developers, property owners, and businesses to improve resilience of buildings and reduce flood insurance premiums. The guidelines are not regulatory requirements, but they are coordinated with Hoboken's flood-related policies to promote smart construction practices.
- In 2017, Hoboken adopted a Green Building and Environmental Sustainability Element to its Master Plan, which presented sustainability recommendations, including actions to address coastal flooding and rainfall flooding. Recommendations of this element included, among others, adopting a Disaster Recovery Ordinance, participating in the FEMA Community Rating System (CRS) program, and developing a stormwater utility and stormwater impact fee.

- The Hoboken 2018 Master Plan Reexamination included an updated Land Use Element, which echoed the Green Building and Environmental Sustainability Element's recommendations for a stormwater utility and stormwater impact fee.
- Hoboken amended its **Flood Damage Prevention Ordinance** in 2018 to increase freeboard standards.
- The 2020 North Hudson Sewerage Authority (NHSA) Long-Term Control Plan for combined sewer overflows proposed to increase capacities of the wastewater treatment plant and two pump stations in Hoboken and to construct two stormwater storage tanks in Hoboken with a total of 10 million gallons of storage.

After Hurricane Sandy, the US Department of Housing and Urban Development (HUD) launched the Rebuild by Design competition, which gave communities the opportunity to undergo collaborative design processes and submit proposals for funding of creative strategies to improve resilience. Hoboken was selected for funding in 2014 and was awarded \$230 million for implementation of the **Rebuild by Design – Hudson River: Resist, Delay, Store, Discharge** project.

### **PROJECT PROFILE** REBUILD BY DESIGN – HUDSON RIVER

The Rebuild by Design – Hudson River (RBD-HR) project is a multipronged project aimed at reducing flood risk in Hoboken that was selected in the US Department of Housing and Urban Development (HUD) Rebuild by Design competition and is managed by the NJDEP and the City of Hoboken. The "Resist" portion of the project, which is managed by NJDEP, consists of a proposed series of floodwalls and levees that will run along the eastern border of Hoboken and portions of Jersey City and Weehawken to protect against storm surge from the Hudson River; this portion of RBD-HR was in the design phase as of December 2020.



Design drawing systems.

Source: Hoboken Element, 2017

Design drawing of Northwest Resiliency Park stormwater management

aster Plan Green Building and Environmental Sustainability

The "Delay, Store, Discharge" component of the project is managed by Hoboken and involves a partnership with the North Hudson Sewerage Authority (NHSA). "Delay, Store, Discharge" aims to mitigate stormwater flooding through a combination of green/grey infrastructure, policy initiatives, separate storm sewer construction, and combined sewer system improvements. Construction of large stormwater storage tanks beneath parks is a key strategy for this component of RBD-HR: this approach is used in Southwest Resiliency Park, Northwest Resiliency Park, 7th/Jackson Street Park, the NJ Transit Site, and the Block 10 site. These park projects are in varying stages of completion, with the Southwest Resiliency Park and 7th/Jackson Street Parks already completed. More information about the RBD-HR project can be found at https://www.nj.gov/dep/floodresilience/rbd-hudsonriver.htm.



Rendering of proposed urban amenities along floodwall component of RBD-HR.

Source: RBD-HR FEIS Figure ES.7

### BAYONNE

Bayonne prepared its most recent Master Plan Re-examination Report in 2017 with recommendations focused on growth through mixed-use development, redevelopment of industrial sites, and economic revitalization.

The City participated in Hudson County's 2020 Hazard Mitigation Plan (HMP) update along with Hoboken and Jersey City. The HMP identified several actions that Bayonne is taking or has already taken to mitigate stormwater flooding. As of the 2020 HMP update, Bayonne had already installed back-up generators at critical facilities such as fire stations and Senior Citizens Housing facilities and was in progress with installations of generators at several schools. The HMP indicates that Bayonne intends to incorporate goals and actions from the HMP its next master plan update. According to the HMP, Bayonne also identified various storm or combined sewer capacity expansion projects that would reduce flooding in flood-prone areas and various stormwater pump station (for 8 pump stations located in flood hazard areas) elevation or flood wall construction projects; these projects were in progress as of 2020.

Bayonne's 2020 Long-Term Control Plan for combined sewer overflows proposed to increase conveyance of combined sewage from its system to the Passaic Valley Sewerage Commission (PVSC) Treatment Plant, to install five stormwater storage tanks with a total storage volume of 19.8 million gallons, and to install green infrastructure across the city in three phases. The plan noted that two additional stormwater storage tanks would be needed if the flow to PVSC could not be increased.

The former site of the Military Ocean Terminal at Bayonne (MOTBY) has undergone significant mixed-use redevelopment in recent decades, including the import of fill materials to elevate the site above design flood elevations and stabilization of several miles of shoreline, which included new bulkheads, piers, revetments, and living shorelines. Redevelopment in the area is still ongoing, as described in the Our Communities section.

Hudson County includes Jersey City, Hoboken, and Bayonne, and has led various planning initiatives that impact resilience in these municipalities and the entirety of Hudson County. A summary of these planning initiatives is provided here:

### HUDSON COUNTY

- Following Hurricane Sandy, the Hudson County Division of Planning prepared a **Strategic Recovery Report** for the county, funded by a grant through the NJ Department of Community Affairs (NJ DCA), by coordinating with responsible officials across the departments of Hudson County and the municipalities of the county. The report detailed damages from Hurricane Sandy and presented and prioritized repair and mitigation activities to be undertaken by Hudson County and the individual municipalities.
- Hudson County received funding through NJ DCA's Post-Sandy Planning Assistance Grant Program to launch the Engaging and Strengthening Hudson County Planning Initiative, which included concurrent development of the 2016 Hudson County Master Plan Reexamination, the Parks Master Plan. the **Comprehensive Economic Development** Strategy (CEDS) Plan, and the County Capital Improvement Plan. Flood resilience was a central theme in all of these plans, and the county acknowledged the importance of a holistic approach to flood resilience by leveraging different tools available. The plans integrated goals and actions that were included in the Hudson County Strategic Recovery Report and the 2015 Hudson County Hazard Mitigation Plan.
- In accordance with the Disaster Mitigation Act (DMA) of 2000, the Hudson County Office of Emergency Management leads efforts to complete 5-year updates of the Hudson County Hazard Mitigation Plan (HMP). The most recent update was initiated in 2019 and completed in 2020 and included participation of all municipalities within Hudson County. The plan identified coastal storms, floods, severe weather, and severe winter weather as the highest-ranking hazards of concern for Hudson County. The plan also identified overarching goals of hazard mitigation planning. such as promoting a sustainable economy and increasing public awareness. Mitigation actions to be completed by Hudson County and the individual municipalities were listed, along with estimated timelines for completion, costs, and potential funding sources. These mitigation actions were well aligned with the recommendations made in other resiliencerelated plans for Hoboken and Jersey City.
- In 2016, Hudson County also updated its Land Development Regulations (not yet adopted) with a focus on flood resilience and complete streets. Flood resilience was addressed through Stormwater Management Design Standards as well as guidelines for implementation of green infrastructure. The stormwater-related Land Development Regulations are applicable to any development project that discharges stormwater runoff directly or indirectly into a county road or facility.

### **RESILIENCE PROJECTS**

In addition to the planning initiatives and projects discussed in the previous pages, there are a variety of other resilience projects that have already been completed, are currently in design or construction, or are being planned by the four cities, state and federal agencies, and regional infrastructure entities. The projects address resilience through a variety of approaches including elevation of critical infrastructure, construction of floodwalls or levees around critical infrastructure or vulnerable areas, installation of green infrastructure or large stormwater storage tanks, and wetland restoration or creation.

A chart of recently completed, ongoing, and proposed resilience-related projects in the Northeastern New Jersey region is provided in the following pages. The chart includes brief descriptions of the projects and information about project status. The map on this page shows approximate locations of projects for which location data were available. The numbers shown on the map correspond to project numbers in the chart. The chart and map are works-in-progress and will continue to be updated on the project website at www.resilient.nj.gov/nenj.



MAP ID	PROJECT NAME	STATUS	SPONSOR(S) / AGENCY(S)	MUNICIPALITY	CATEGORY	NOTES	LOCATION
1	Country Village Street Levee (Priority Area A)	Conceptual	NJDOT	Jersey City	Flood/Stormwater Management	Construction of street levee around Route 440 and elevating the roadway 3 to 4 feet to maintain it as a safe evacuation route and to protect Country Village. Estimated to benefit 2,000 residents and to have a capital cost of \$24M.	Along Route 440 from Bayonne to NJCU Athletic Complex
2	Society Hill Elevated Boardwalk Levee (Priority Area B1)	Conceptual	Jersey City	Jersey City	Flood/Stormwater Management	Elevate existing Hackensack RiverWalk by five to six feet to create a raised boardwalk levee. Recommended to complete this project after Country Village Street Levee (Priority Area A). Estimated capital cost of \$9.5M.	Droyer's Point along waterfront
3	Society Hill Walkway Levee (Priority Area B2)	Conceptual	Jersey City	Jersey City	Flood/Stormwater Management	Create walkway levee along Morris Canal Greenway. Recommended to be completed in conjuntion with Route 440 Boulevard State project. Location of proposed walkway levee to be confirmed.	Hackensack Riverfront
4	Marion and Lincoln Park Floodwalls (Priority Area C)	Conceptual	Jersey City	Jersey City	Flood/Stormwater Management	Proposed floodwalls to protect infrastructure in Marion + Lincoln Park area, to be complemented by wet and dry floodproofing of individual buildings.	Along Hackensack River or Route 1/9 from Hudson Mall to north of Duffield Ave
5	Mill Creek Walkway Levee or Berm (Priority Area D)	Conceptual	Jersey City	Jersey City	Flood/Stormwater Management	Proposed elevated walkway or berm to be constructed along with raising of land proposed for Grand Jersey Redevelopment Area.	Mill Creek
6	Mill Creek/Crescent Park Redevelopment Project (Priority Area D)	Planning	Private - Argent Ventures (for Crescent Park portion)	Jersey City	Redevelopment, stormwater management	Proposed elevation of land in the Grand Jersey Redevelopment Area (six to nine feet), including filling in of Mill Creek. A portion of redevelopment is being completed as the Crescent Park Project, which includes redevelopment of the vacant lot at 246 Johnston Street (proposed mixed-use development with 2,000 residential units and 50,000 sq ft of retail space.) Proposed construction of 5 MG stormwater storage tank for combined sewer outfall at Mill Creek. Permit submitted for remediation early in 2021.	246 Johnston Ave
7	Hudson Riverwalk Boardwalk Levee and Dudley and Washington Street Elevations (Priority Areas E and F)	Conceptual	NJDEP	Jersey City	Flood/Stormwater Management	Recommended conversion of Hudson River Waterfront walkway to boardwalk levee at height of approx. 14 feet above mean sea level. Recommended raising of Washington and Dudley Streets by three to four feet.	Hudson Riverfront Walkway Dudley St and Washington St south of Dudley.
8	Downtown North Resiliency Measures (Priority Area F)	Conceptual	Jersey City, NJ Transit	Jersey City	Flood/Stormwater Management	Recommended flood protection barrier along southern boundary of NJ Transit railyard and improvements to wet weather pumping stations/treatment facilities in the downtown north area.	South border of NJ Transit railyard at border with Hoboken
9	PANYNJ Hardening of Exchange Place, Newport, and Grove Street PATH Stations	Construction	PANYNJ	Jersey City	Infrastructure Resilience	New elevators, escalators, and flood protection measures at the three stations. Work has already begon at Newport Station. Work anticipated to be completed at all three stations in 2022.	Exchange Place, Newport, and Grove Street PATH Stations in Jersey City
10	Lincoln Park West Wetland Restoration Project	Complete	Hudson County, NJDEP, USACE, PANYNJ, NOAA	Jersey City	Wetland Restoration	Restoration of 34 acres of wetlands and 11 acres of transitional wetland areas at a former landfill site. The project created recreational opportunities including a golf course and nature walk. Funding was provided through a variety of sources, including a NOAA, an oil spill settlement fund, and a NJDEP damages fund.	Lincoln Park
11	Liberty State Park Natural Resource Restoration Project.	Design	NJDEP	Jersey City	Wetland Restoration	Restoration of 234 acres of wetlands, including creation/enhancement of 27 acres of freshwater wetland, 50 acres of saltmarsh, and 133 acres of upland maritime habitat in a contaminated portion of Liberty State Park. 23 acre portion may have already been completed. Remaining design completion expected Summer of 2021. Construction expected to begin Fall 2021.	Liberty State Park
12	Long Slip Fill and Rail Enhancement Project	Construction	NJ Transit	Jersey City	Flood/Stormwater Management	Fill of Long Slip Canal, former freight barge channel, above floodplain and construction of six new elevated tracks, with walkway extension to Hoboken Terminal. Project will include extending the 18th Street combined sewer outfall and two 8-inch drainage pipes from the PATH tunnels. Construction contract for Phase 1 awarded February 2020.	Long Slip Canal at border between Jersey City and Hoboken, north of 18th Street
GI*	Jersey City City Hall Green Infrastructure Demonstration Projects	Complete	Jersey City	Jersey City	Green infrastructure	Rain gardens and bioswales installed around Jersey City City Hall.	Jersey City City Hall
GI*	Jersey City Green Infrastructure Demonstration Projects	Complete	Rutgers Cooperative Extension Water Resources Program, PVSC, Jersey City, JCMUA	Jersey City	Green infrastructure	Arlington Park rain garden completed 8/15/16. PS5 stormwater planters completed 2015. MLK drive tree planters/ permeable pavement project in planning.	Three sites in Jersey City
GI*	Columbia Park Green Infrastructure (PVSC)	Design	PVSC	Jersey City	Green infrastructure	Green infrastructure installation by PVSC at Columbia Park.	Columbia Park
GI*	Jersey City Rain Gardens	Planning	Green Acres, Jersey City	Jersey City	Green infrastructure	Rain garden projects funded through Green Acres program at Lafayette Park, Bayside Park, and McGovern Park.	Lafayette Park, Bayside Park, McGovern Park
NM**	JCMUA LTCP	Planning	JCMUA	Jersey City	Stormwater Management	Includes implementation of green infrastructure, source controls, and CSS repairs before 2026; sewer separation project at Bates and Bright Streets; 5 treatment shafts (storage tanks) to be constructed incrementally before 2049.	Multiple locations in Jersey City

\*Green Infrastructure, \*\*Not Mapped

MAP ID	PROJECT NAME	STATUS	SPONSOR(S) / AGENCY(S)	MUNICIPALITY	CATEGORY	NOTES	LOCATION
13	Newark Riverfront Park (Joseph G. Minish Passaic River Waterfront Park and Historic Area)	Construction	USACE, NJDEP, Newark	Newark	Flood/Stormwater Management	Construction of bulkheads by USACE, waterfront walkway and park by City of Newark. Construction began 1999/2000, portions of bulkhead construction remain to be completed by 2022. Park construction completed by Trust for Public Land around 2016.	Along the Passaic River from Brill Street to Bridge Street.
14	USACE Passaic River Tidal Area Project	Design	USACE, NJDEP	Newark	Flood/Stormwater Management	"Recommended Plan (2019): total 4,850 LF alignment including six floodwall segments, levee segment at 14 ft NAVD88 (2 feet higher than storm surge levels during Hurricane Sandy), seven road closure structures, one railroad closure structure, interior drainage system in low lying areas for protection of Ironbound neighborhood and downtown. <b>Goal</b> : reduce risk of coastal flooding to 15,000 people and 2,300 structures, \$4.2 million annualized benefits (note: does not address rain and CSO-related flooding). <b>Status</b> : detailed design phase began August 2019. First construction contract scheduled for award in November 2021. Aim is construction completion by end of 2022. <b>Additional background</b> : National Economic Development (NED) plan for area included 13.5 miles of floodwalls at 16 feet NAVD88 in Newark, Harrison, and Kearny. NJDEP proposed focusing on project in Newark only because of project costs, which led to proposed 4,850 LF alignment (called Locally Preferred Plan or Newark Flanking Plan)."	Various locations in Newark
15	USACE Passaic River Basin General Reevaluation Study	Planning	USACE, NJDEP	Newark	Flood/Stormwater Management	Consideration of structural and non-structural flood management projects on the Passaic River. Floodwall/levee alternatives 14A, 16A, and Tunnel Plan are mapped.	Newark, Kearny, and Harrison
16	PVSC Resiliency Projects	Construction	PVSC	Newark	Flood/Stormwater Mgmt	Various resiliency projects at PVSC WWTP (WWTP Perimeter Floodwall, Stormwater Pumping Stations, & Stormwater Collection System).	PVSC WWTP
17	Newark NFWF Living Shoreline/Marsh Restoration	Construction	NJDEP, NFWF	Newark	Wetland Restoration	A living shoreline will be constructed utilizing a stone revetment backed with a sand shoreline, and wetland restoration. The project is expected to stabilize and protect the wetland and upland areas from Newark Bay, raising and rebuilding areas experiencing the most severe erosion within the wetland and eradicating invasive species and regrading areas where invasive species are currently present. The project will also consist of tidal pools and planting clusters of woody vegetation at select locations to provide roosting, nesting, and foraging habitat for State threatened yellow and black crowned night herons. Bid released Q1 2020, further details not found. https://www.nj.gov/dep/oclup/case-studies-projects/nj-ecol-solution-projects.html	North of I-78 along Newark Bay
GI*	Newark Doing Infrastructure Green (DIG)	Ongoing	Newark DIG	Newark	Green infrastructure	Various completed and in progress green infrastructure projects in Newark	Multiple sites across Newark
NM**	Newark Greenstreets	Ongoing	Newark, CBOs	Newark	Green infrastructure	Planted 1600+ trees in Newark	Multiple sites across Newark
NM**	Newark Light Rail Signals and Communication Repair	Unknown	NJ Transit	Newark	Infrastructure	Resiliency of Newark Light Rail system via improvements to signals and communications components.	Unknown
18	Rebuild by Design Hudson River	Design	NJDEP/City of Hoboken	Hoboken	Flood/Stormwater Management	Delay, Store, Discharge (separate storm sewer modification), managed by Hoboken, involves stormwater storage and green infrastructure. Stormwater management systems are proposed at NJ Transit site and Block 10 site. Resist portion, managed by NJDEP, involves construction of flood wall/berm in Hoboken, Jersey City, and Weehawken. Resist portion is 95% design as of Fall 2021, anticipated completion Fall 2025.	Multiple locations in Hoboken and northern Jersey City.
19	Hoboken Southwest Park (Block 12)	Complete	Hoboken	Hoboken	Stormwater Management	Construction completed 2017, stores 200,000 gallons of water.	Block 12 bound by Observer Hwy, Harrison St, Paterson Ave, & Jackson St
20	Hoboken 7th and Jackson Street Park	Complete	Hoboken	Hoboken	Stormwater Mgmt	Construction completed 2020. Includes GI and underground detention systems to store 470,000 gallons of stormwater.	7th Street and Jackson Street
21	Hoboken Northwest Resiliency Park	Construction	Hoboken	Hoboken	Stormwater Management	Construction activities began September 2019. Anticipated completion in 2021. Will store 1 MG of water in storage structure + 750,000 gallons in green infrastructure.	Between 12th and 13th Streets and Madison and Adams Streets
22	Hoboken PATH Station Hardening	Complete	PANYNJ	Hoboken	Infrastructure Resilience	Flood protection measures at Hoboken PATH Station. Completion scheduled for August 2020 as per PANYNJ website.	Hoboken PATH Station
23	9th and Madison Infrastructure Improvements	Design	Hoboken, NHSA	Hoboken	Stormwater Management	Sewer replacement, curb inlet replacement, road elevation, and water system improvements on Madison between 9th and 11th Streets	Madison St btwn 8th & 11th Sts, 9th St btwn Jefferson & Monroe Sts, 11th St btwn Monroe & Madison Sts.
24	Hoboken NJ Transit Terminal Accessibility and Resiliency Improvements	Unknown	NJ Transit	Hoboken	Infrastructure Resilience	Flood protecion by sealing stairway entrances at Hoboken Terminal.	Hoboken NJ Transit Terminal
25	NHSA H6/H7 Storm Sewer Project	Construction	NHSA	Hoboken	Stormwater Management	This storm sewer project is being completed by NHSA as one of the various measures of its Long-term Control Plan. The project involves construction of separated storm sewers in the H6 and H7 sewer service areas in northern Hoboken, which will flow to the stormwater storage tank being constructed in Northwest Resiliency Park. Construction of storm sewers and a force main on 13th Street between Adams and Madison Streets was underway in January 2021, and later phases will include storm sewer construction in the surrounding streets. The project aims to reduce combined sewer overflows and mitigate street flooding in the sewer service areas.	H6 and H7 sewer service areas, which are in northern Hoboken.
GI*	Hoboken City Hall Green Infrastructure Demonstration Project	Complete	Hoboken	Hoboken	Green infrastructure	Installation of four cisterns, four rain gardens (two in front and back of City Hall, each), permeable pavement, and four shade trees. Completed in 2016 with funding through state revolving fund.	Hoboken City Hall

\*Green Infrastructure, \*\*Not Mapped

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MAP ID	PROJECT NAME	STATUS	SPONSOR(S) / AGENCY(S)	MUNICIPALITY	CATEGORY	NOTES	LOCATION
GI*	Hoboken Rain Garden Demonstration Project	Complete	Sustainable Jersey	Hoboken	Green infrastructure	Curb extensions at 4th and Garden	Intersection of 4th and Garden Streets
GI*	Washington Street Rehabilitation and Redesign Project	Complete	Hoboken	Hoboken	Green infrastructure/other	Water system improvements and road reconstruction on Washington St across Hoboken. 15 rain gardens constructed at intersections.	Washington Street
GI*	Hoboken Existing Green Infrastructure	Complete	Hoboken	Hoboken	Green infrastructure	Various completed green infrastructure installations in Hoboken.	Multiple sites
GI*	Rebuild by Design - Proposed Green Infrastructure	Design	NJDEP/City of Hoboken	Hoboken	Green infrastructure	Proposed green infrastructure installations as part of the Delay, Store, Discharge portion of the Rebuild by Design - Hudson River project.	Multiple sites
NM**	Hoboken Boiler and Terminal Repairs	Unknown	NJ Transit	Hoboken	Infrastructure	Project listed in Appendix F of RBD-HR FEIS. Status of project unknown. Construction of resilient repairs to Hoboken Boiler System that provides heat/hot water to Terminal Building.	Hoboken Terminal
NM**	Hoboken Floodproofing of Critical Facilities	Complete	Hoboken	Hoboken	Flood Mitigation	Dry and wet floodproofing of 3 firehouses, Midtown Garage, & Multi-service Center via removable flood doors/walls, exterior waterproofing, and installation of backflow preventors. Hoboken Public Library prepared with manually inserted flood barriers, exterior waterproofing (coating of building to resist water penetration), sump pumps, & backflow preventers. Assume projects are complete but need confirmation.	Multiple locations in Hoboken
NM**	Hoboken Microgrid	Planning	Hoboken, NJ BPU, US DOE, PSE&G	Hoboken	Energy	Proposed microgrid to connect 29 critical facilities along Washington Street and in Hoboken Housing Authority properties, with main controls located at City Hall. Feasibility study completed 2018/2019 by Concord Engineering.	Washington Street, Hoboken public housing, and Hoboken City Hall
NM**	Hoboken Terminal Resilient Signals and Power	Complete	NJ Transit	Hoboken	Infrastructure	Elevation of signal equipment at Hoboken Terminal Tower. Elevation of substation for Hoboken Terminal's House Power to the second floor of the Immigrant/Pullman building. Construction completed December 2016.	Hoboken Terminal
NM**	Hoboken Yard Signal Power	Unknown	NJ Transit	Hoboken	Infrastructure	Project listed in Appendix F of RBD-HR FEIS. Status of project unknown. Resilient design and construction of signal devices, cabling, and associated systems at Hoboken Yard.	Rail yards at Hoboken Terminal
NM**	NHSA LTCP	Planning	NHSA	Hoboken	Stormwater Management	Increase WWTP capacities, construct new Adams Street WWTP treated effluent outfall, increase capacities of pump stations, construct stormwater storage tanks.	Multiple locations in Hoboken
NM**	NHSA Mitigation	Unknown	NHSA, NJ	Hoboken	Flood Mitigation	Various physical mitigation measures at NHSA administrative building, including floodwall in garage; installation of watertight doors, sump pump, and exhaust system in pipe tunnel; installation of removable barrier at exterior entrances; and a watertight conduit (source: RBD-HR Appendix F project list)	1600 Adams Street
NM**	NHSA Wet Weather Pumping Stations	Complete	NHSA	Hoboken	Stormwater Management	84 MGD wet weather pumping station (H1 Pump Station) constructed on Observer Highway in 2011/2012 to alleviate flooding in southwest Hoboken. 80 MGD wet weather pumping station constructed on 11th Street at Hudson Street (H5 Pump Station) in 2016 to alleviate flooding in northwest Hoboken.	H1 Pump Station on Observer Highway and H5 Pump Station on 11th Street
NM**	Hudson-Bergen Light Rail Signals & Communications Repair	Unknown	NJ Transit	Hoboken, Jersey City	Infrastructure	Elevation of Central Instrument House that controls switch movements for HBLR.	Central Instrument House for HBLR
26	Bayonne Ferry Terminal	Planning	Bayonne, PANYNJ	Bayonne	Transportation	Future ferry terminal from Bayonne to New York City. 10-year lease approved in January 2020.	South side of MOTBY
27	Francis G. Fitzpatrick Park Upgrades	Construction	Bayonne	Bayonne	Stormwater Management	New park amenities, such as new playgrounds, to be constructed at the park. The park renovations include construction of a separate storm sewer along Avenue C from 26th Street to 28th Street to alleviate flooding in the neighborhood, and construction of a cistern for stormwater storage beneath the park. Construction began in October of 2020. The project was partially funded by a Hudson County Open Space Trust Fund Grant and funding through the New Jersey Water Bank state revolving fund.	Park located on Avenue C between W 26th and W 27th Streets in Bayonne. Separated sewer construction on Avenue C between W 26th and W 28th Streets.
GI*	Bayonne Green Infrastructure Feasibility Study	Planning	Rutgers	Bayonne	Green infrastructure	Recommended sites for green infrastructure in Bayonne	Multiple sites across Bayonne
NM**	Bayonne LTCP	Planning	Bayonne	Bayonne	Stormwater Management	One proposed alternative includes increased conveyance to PVSC, five combined sewage storage tanks (combined storage of 19.8 MG), and improvements to Oak Street Pump Station.	Multiple sites across Bayonne
28	NJ TRANSITGRID TRACTION POWER SYSTEM	Planning	NJ Transit, NJ BPU, US DOE, FTA	All	Energy	Proposed microgrid to provide limited electrical service to critical NJ TRANSIT (Morris & Essex, Main Line, & Hudson-Bergen Light Rail) & AMTRAK (Northeast Corridor) services. Proposed project includes construction of a natural gas-fired power plant on undeveloped land in the Koppers Coke Redevelopment Area in Kearny, a new solar facility, and new electrical lines and substations (substations in Kearny & Hoboken). Under separate contract, new Henderson St substation to be constructed at Hoboken/Jersey City border. Final Environmental Impact Statement was published in April 2020. The NJ TRANSITGRID program also includes a separate project, DISTRIBUTED GENERATION SOLUTIONS, that aims to provide resilient power to NJ TRANSIT infrastructure through various technologies.	Main facility (natural gas-fired plant) along Morris & Essex line in Kearny. Proposed substations in Kearny along Morris & Essex Line and on southwest border of Hoboken.
NM**	PSE&G Energy Strong	Construction	PSE&G	All	Energy	Elevation/relocation of substations and other resiliency improvements to gas and electricity infrastructure across PSE&G's system. Includes combination of Hoboken's 3 electrical substations into 2 elevated substations (Marshall and Madison Street Substations combined into one elevated Madison Street Substation). The Madison Street Substation was constructed and fully operational by Fall of 2020, with sitework remaining to be completed by March 2021.	

\*Green Infrastructure, \*\*Not Mapped

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#### HOBOKEN COVE

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The Hoboken Cove Community Boathouse offers free kayaking at Maxwell Place Park in northern Hoboken. Image Source: City of Hoboken

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# APPENDICES

### JERSEY CITY

#### **Development Information**

- Between 2015 and 2019. 6.591 new housing units received certificates of occupancy per the NJDCA Construction Reporter. Of those, 86% were in multi-family buildings
- From the beginning of 2016 to September 30, 2020, 21,142 building permits were issued. Certificates of occupancy lag behind building permits by one or more years depending on the scale of construction, so a large quantity of new housing units are poised to come online in the next several years.
- Maior development areas:
- Journal Square: 1,963 residential units have been recently built, along with over 2 million sq. ft. of office and over 60,000 sq. ft. of retail. An additional 11,011 residential units are either in construction or have been approved, along with 480,000 sg. ft. of office and 490,000 sg. ft. of retail. Another 2.877 residential units have been proposed.
- Bergen Lafayette: 2,118 residential units have been recently built, along with over 50,000 square feet of office space and approximately 47,000 square feet of retail space. Nearly 2,500 additional residential units are under construction or have been approved, along with approximately 100,000 square feet of office space and 90,000 square feet of retail space
- Downtown: 24.255 residential units, over 7 Million square feet of office space, and about 1.5 Million square feet of retail space have been recently built Downtown. Over 13,000 additional units have been approved or are under construction, along with about 1.8 Million square feet of office space and nearly 575,000 square feet of retail space.

#### DEVELOPMENT TRENDS CONTINUED

#### **Caven Point Redevelopment Plan**

The Caven Point area is in the southeastern portion of the City along the waterfront between the Liberty Harbor and Greenville Industrial redevelopment areas. The Redevelopment area has been largely built out at this point with a portion of Liberty National Golf Course and a residential development at Port Liberte. The entire area is within the floodplain.

#### **Claremont Industrial Redevelopment Plan**

The Claremont Industrial Redevelopment Plan was originally adopted in 1984 and has been amended several times, most recently in 2013. The area encompasses land to the west of the New Jersey Turnpike in the southern part of the City. The Plan's Industrial District has been built-out by two warehouse / distribution facilities. The Residential District remains undeveloped and permits a density of 50 units per acre. Most of the area is within the floodplain.

#### **Colgate Redevelopment Plan**

The Colgate Redevelopment Plan was originally adopted in 1989. It has been amended seventeen times since, most recently in 2019. The area is along the waterfront in the east central part of the Downtown neighborhood. Many of the blocks in the area have been redeveloped. Some redevelopment potential remains in the Mixed-Use district, which permits residential development at a density of 550 units per acre. Most of the area is in the floodplain.

#### Exchange Place North Redevelopment Plan

The Exchange Place North Redevelopment Plan was originally adopted in 1983 and has been amended 13 times, most recently in 2015. The area is located in the Downtown neighborhood on the waterfront near the Exchange Place PATH station and ferry terminal. Most of the area has been redevelopment, but there are several substantial surface parking lots remaining that could support future redevelopment projects. A mix of residential and non-residential uses are permitted with structures up to 50 stories permitted in the City View District, where the largest surface parking lot is located. The entire area is in the floodplain.

#### Greenville Industrial Redevelopment Plan

The Greenville Industrial Redevelopment Area is in the southeastern corner of the City adjacent to the waterfront and Bayonne. The goal of the Redevelopment Plan is to transform the former dilapidated industrial area into a modern industrial, warehousing, distribution development that uses the waterfront and complements nearby shipping facilities. A substantial amount of redevelopment has taken place in the area, but some future development opportunities remain. The waterfront portion of the area is in the floodplain, but the northwest section closer to the Turnpike is not.

#### Hackensack River Edge Redevelopment Plan

The Hackensack River Edge Redevelopment Plan is in the west side of the City along the Hackensack River. The area is located under the Pulaski Skyway and is developed with a large warehousing facility and several smaller facilities. The Plan was most recently amended in 2013. Development of the Hackensack Waterfront Walkway is a required component of the Plan. The existing truck terminal facilities in the southern portion of the area have not been redevelopment but are permitted to remain as non-conforming uses. The ultimate use of this area will be development of public park and recreational facilities. Portions of the area are in the floodplain.

#### Liberty Harbor Redevelopment Plan

The Liberty Harbor Area is a large portion of the eastern waterfront of the City south of Downtown. The area encompasses Liberty Science Center, Liberty State Park, a portion of Liberty National Golf Course, and some warehousing / distribution facilities. he Residential Mixed-Use District,

located in the southern end of the area at the north side of the golf course has substantial future development potential. A hotel, offices, retail, and up to 2,006 residential units are permitted within the District. Most of the Redevelopment area is in the floodplain, but the Mixed-Use District where most remaining development potential exists is only partially encumbered.

#### Liberty Harbor North Redevelopment Plan

#### Marine Industrial Redevelopment Plan

#### Morris Canal

The Morris Canal Redevelopment Plan was originally adopted in 1999. Since then, it has been amended 37 times, most recently in June 2020. The Plan encompasses approximately 280 acres in central Jersey City. The HBLR is an important feature in the area, with several existing stations and a proposed new station in the area's south side.

The area is divided into a variety of mixed-use, industrial, adaptive-reuse, and residential zones. Several mixed-use Transit Oriented Development (TOD) districts near the light rail provide the most substantial residential density and height for future redevelopment projects. Portions of the area, including most of the property near the HBLR, are in the floodplain.

#### Route 440 – Culver

The Route 440 – Culver Redevelopment Area is in the West Side neighborhood along the southeast side of Route 440. The area is located a block west of the existing HBLR, and a proposed light rail extension will traverse the area to reach the Bayfront Redevelopment Area on the opposite side of Route 440.

Liberty Harbor North is just south and west of Downtown and north of Liberty State Park. The HBLR track passes through the area and makes stops at Jersev Avenue in the west and Marin Boulevard in the east. Several blocks have been redeveloped. The southern portion of the area known as the "Tidewater Basin District" has vet to be redeveloped.

The total build-out permitted under the northern and central parts of the Plan is over 8,200 residential units, over 500,000 square feet of retail, hotels. office space, and parking garages. The Tidewater Basin District permits a maximum build-out of over 6,600 residential units, 65,000 square feet of retail, and over 120,000 square feet of entertainment or cultural space. Most of the area, and nearly all of the Tidewater Basin District, is in the floodplain.

The Marine Industrial Redevelopment Area is a vacant, mostly underwater, area along the Hackensack River in the west side of Jersev City. The Plan permits a variety of commercial and industrial uses. The Commercial portion of the area has been redeveloped in conjunction with neighboring properties along the west side of Route 440. The land designated for Industrial Use is in the floodplain and appears to be environmentally constrained. The undeveloped part of the area may have limited development potential at this point.

The Plan permits mixed-use development where mainly non-residential highway-oriented uses exist today. The blocks closest to Route 440 are permitted to be developed to 12 stories in height while blocks to the east closer to existing residential neighborhoods have lower height limits. The western portion of the area closest to Route 440 is in the floodplain.

#### **Employment Data**

Total employment: 146,630

Top 10 industries by employment:

- 1. Central Bank, commercial banking, savings institutions, and credit unions: 10.798 employees
- 2. Investment banking, securities dealing, securities brokerage, and commodity contracts dealing and brokerage: 6,256 employees
- 3. Local government (education): 5,708 employees
- 4. Miscellaneous financial investment activities: 5,191 employees
- 5. Miscellaneous real estate: 5,012 employees
- 6. Local government (miscellaneous services): 4,312 employees
- 7. Insurance agencies, brokerages, and related activities: 4,036 employees
- 8. Employment services: 3,670 employees
- 9. Retail Nonstore retailers: 3,352 employees
- 10. Computer systems design services: 2,925 employees
- Top 10 industries by employment:
- 1. Central Bank, commercial banking, savings institutions, and credit unions: \$4.1 billion
- 2. Investment banking, securities dealing, securities brokerage, and commodity contracts dealing and brokerage: \$2.2 billion
- 3. Owner-occupied dwellings (home ownership): \$1.7 billion
- 4. Miscellaneous real estate: \$1.3 billion
- 5. Insurance agencies, brokerages, and related activities: \$1.2 billion
- 6. Miscellaneous financial investment activities: \$1.1 billion
- 7. Tenant-occupied housing: \$1.0 billion
- 8. Insurance carriers, except direct life: \$799.9 million
- 9. Wholesale Miscellaneous nondurable goods merchant wholesalers: \$638.8 million
- 10. Local government (education): \$602.8 million

2018 IMPLAN Data

#### Housing

- 112.480 units
- 10.2% vacant
- 38.8% 10+ unit buildings

#### NEWARK

#### **Development Information**

- Between 2015 and 2019, 2,160 new housing units received certificates of occupancy per the NJDCA Construction Reporter. Of those, 178 were in one- and two-family dwellings, 279 were in mixed-use projects, and 1,703 were in multi-family buildings. The DCA records include threefamily residences, which are one of the most common and popular development types throughout large portions of the City within the multifamily category.
- The building permit records for total housing units have not reflected a strong upswing in new activity. From the Beginning of 2016 to September 30, 2020, 1,804 building permits were issued. Certificates of occupancy lag behind building permits by one or more years depending on the scale of construction, so the actual development activity in the City has slowed slightly in recent years. However, a significant amount of new development has received site plan approval from the City's Central Planning Board and Zoning Board of Adjustment during these years. These pending developments could lead to more development activity in a short period of time.

#### **Zoning Information**

- The Port and I-3 Zones permit land uses that include port facilities. warehousing, distribution, light-, medium-, and heavy-industry, and other similar industrial and trucking-related uses. Recent development in the I-3 Zone includes a truck stop and warehousing and distribution facilities, some of which include cold storage.
- The I-1 Light and I-2 Medium Industrial zones are also impacted by the flood hazard area in the East Ward in proximity to the Passaic River. These zones are transitional areas around the perimeter of the Ironbound Neighborhood that give way to the MX-1 and MX-2 mixeduse zones, the C-2 Community Commercial Zone, and the R-3 (One to Three-family) and R-4 (Low-Rise Multifamily) Zones closer to the heart of the neighborhood.
- The City uses a hybrid zoning code that includes use standards for the different zone districts and bulk standards associated with building types that are permitted in various districts. The general use, density, and bulk standards that apply to portions of the City within the flood hazard area include:

- Industrial Zones
- The Medium Industrial (I-2) zoning allows for industrial development of buildings up to six stories high or 100 feet and permits a range of uses that are generally less compatible with nearby residential neighborhoods than those of Light Industrial (I-1) zoning. Because it allows for a range of uses that are less compatible with residential neighborhoods, I-2 zoning is typically applied in industrial districts of residential neighborhoods or adjacent to roads, waterways and lighter industrial areas that can serve as a buffer.
- The Heavy Industrial (I-3) zoning allows for industrial development of buildings up to ten stories high and permits specific uses that are generally incompatible with residential neighborhoods and thus typically not allowing residential uses.
- Because it allows for uses that are incompatible with and even harmful to residents, I-3 zoning is confined to - and comprises much of - the Newark Industrial District and has very low proximity to any residential neiahborhood.
- Commercial / Mixed-Use Zones
- Community Commercial (C-2) zoning allows for slightly more moderatescale and dense commercial development than in Neighborhood Commercial (C-1) zoning for ground-floor commercial with commercial or residential above in buildings up to five stories high. New develoment must be at least three stories high. C-2 zones are typically the heart of a neighborhood's central commercial district. Parking is not required for any development within the C-2 district. Residential development as part of mixed-use buildings is permitted at a maximum density of 128 units per acre.
- Mixed Use 1: Residential & Commercial (MX-1) zoning allows for a blend of residential and commercial uses within the same building or district, fostering communities with diverse but integrated uses. These are the kinds of places where residents live over shops that offer everyday services, places to work, shop and play. Residential development is permitted at a maximum density of 75 units per acre.
- Mixed Use 2: Residential, Commercial, Industrial (MX- 2) zoning allows for a blend of residential, commercial, and appropriate industrial uses within the same building or district, fostering flexible, working communities with integrated and innovative uses. These are the kinds of places where homes and businesses mix with industry in creative and productive ways. Residential development is permitted at a maximum density of 75 units per acre.

- Residential Zones
  - 37 units per acre.

 One- to Three-Family and Town House Residential (R-3) zoning allows for single-, two- and three-family homes, as well as townhomes, up to three stories high. Other permitted uses include parks, community residences, garages, and day care. The maximum residential density is

 Low-rise Multifamily Residential (R-4) zoning allows for denser, residential development than in One-to-Three- Family and Town House Residential (R-3) zoning, permitting single-, two- and three-family homes and townhomes up to three stories high as well as lowrise multi-family housing up to four stories high. Other permitted uses include parks, community residences, garages, ground floor retail. office or services, and day care. Areas zoned R-4 encourage residential character and do not permit some forms of commercial uses. The maximum permitted residential density is 69 units per acre.

#### **Employment Data**

Total employment: 167,967

Top 10 industries by employment:

- 1. Air transportation: 15,904 employees
- Local government (education): 7,839 employees
- 3. Miscellaneous food and drinking places (non-restaurants: includes bars): 5,574 employees
- 4. Scenic and sightseeing transportation and support activities for transportation: 5,531 employees
- 5. Hospitals: 5,460 employees
- 6. Miscellaneous personal services (including pet care, photofinishing, and parking lots and garages): 5,101 employees
- 7. Miscellaneous real estate: 4,592 employees
- 8. Local government (miscellaneous services): 4,521 employees
- 9. Couriers and messengers: 4,337 employees
- 10. Truck transportation: 4,182 employees

Top 10 industries by employment:

- 1. Air transportation: \$7.1 billion
- 2. Owner-occupied dwellings (home ownership): \$1.8 billion
- 3. Tenant-occupied housing: \$1.2 billion
- 4. Insurance carriers, except direct life: \$1,1 billion
- 5. Hospitals: \$1.0 billion
- 6. Miscellaneous real estate: \$986.3 million
- 7. Scenic and sightseeing transportation and support activities for transportation: \$915.0 million
- 8. Local government (education): \$840.7 million
- 9. Legal services: \$771.7 million
- 10. Truck transportation: \$682.5 million

#### 2018 IMPLAN Data

#### Housing

- 112,724 units
- 14% vacant
- 25.7% 10+ unit buildings

### HOBOKEN

#### **Development Information**

- Over the last five years, over 1,150 new multi-family units and 20 new one- and two-family units have received certificates of occupancy. Building permit data indicates that there are several hundred additional approved units in the development pipeline.
- Specific development information included in the April 2020 Hudson County Hazard Mitigation Plan indicates that 33 projects consisting of approximately 2,100 residential units, a new hotel, and over 200,000 square feet of retail or commercial space were approved, under construction, or otherwise pending. Nearly all of these projects are within the floodplain.

#### Zoning Information

The following summary reviews the zone districts and redevelopment areas in the City that are within the floodplain:

Residential Districts

- R-1 Permits residential development and limited retail on lots at least 2,000 square feet in area. The maximum permitted density is 66 units per acre. Structures are permitted to be 3 stories and 40 feet in height. The maximum permitted building coverage is 60%. Post-Sandy, the City revised its Ordinance to define height as measured from the design flood elevation (DFE) when in the floodplain. The purpose of the zone is generally to conserve and reinforce existing development patterns.
- R-2 Same as the R-1 except places of worship, public parking, and public buildings are also permitted. The purpose is similar to the R-1.
- R-3 Similar to the R-1 and R-2. The minimum lot size is 2.500 in the R-3.
- The City's residential district zoning standards are not conducive to significant new growth. Infill development or redevelopment at a scale consistent with the existing neighborhoods is permitted.

#### **Commercial Districts**

Three of the City's four commercial districts are within the floodplain. The C-2 Central Business District zone is not.

 C-1 Hoboken Terminal District – Permits commercial, retail, service uses on lots at least 5,000 square feet in area with a maximum building coverage of 80%. The purpose is to promote economic job growth and a healthy business environment closest to New Jersey's second busiest transit hub.

- C-3 Neighborhood Business District Permits a mix of commercial uses with residential on upper floors on lots a minimum of 2,000 square feet in area with a maximum building coverage of 60%. The permitted residential density it 87 units per acre. The purpose of the zone is to provide a range of shopping, goods and convenience services that cater largely to residents in the surrounding neighborhood.
- C-4 Hospital District Permits hospital uses on lots a minimum of 85.000 square feet in area with 60% maximum building coverage. The zone is essentially contiguous to the existing hospital. The purpose is to stabilize the existing acute care general hospital and accessory uses and provide for new enhanced medical services and facilities to serve the City, its residents, and surrounding communities.

Industrial Districts

- I-1 Permits manufacturing, offices research laboratories, warehouses. utilities. The minimum lot size is 20.000 square feet and maximum building coverage 65%. The purpose of this district is to establish standards for urban industrial activity; to acknowledge the City's traditional locational advantages for materials handling and fabrication; to maintain employment opportunities for local residents while diversifying and strengthening the Citv's economic base.
- I-2 Permits food processing storage and distribution, manufacturing, retail sales and service, public uses. The minimum lot size is 5,000 square feet and maximum building coverage 60%. The purpose of this district is to establish appropriate standards and uses for rail and other transportationrelated commercial and light industrial activities: to provide criteria for off-street parking and loading; and to otherwise facilitate the movement of vehicular traffic and materials transshipment.
- I-1 (W) Nearly the same as the I-1 district, but also permits planned unit developments on tracts at least 10 acres in area, restaurants, and retail.

#### Other Districts

• W (N) - Permits water-oriented commercial uses, marinas, fishing piers, educational, and public recreational uses. The minimum lot area is 40,000 square feet with a maximum building coverage of 30%. The purpose of this district is to promote comprehensive development which includes a mix of commercial office, retail and residential uses at varying densities, with visual and physical access to the Hudson River waterfront and linking other commercial and residential areas of the City to the waterfront.

#### Employment Data

Total employment: 37,084

- employees

- unions: \$226.0 million 17. Tenant-occupied housing: \$205.0 million

- 20. Insurance agencies, brokerages, and related activities: \$195.8 million

#### Housing

- 27.308 units
- 8% vacant

Top 10 industries by employment: 1. Transit and ground passenger transportation: 4,419 employees Miscellaneous educational services (including technical and trade schools, business schools and computer and management training, educational support services, etc.): 2,403 employees 3. Full-service restaurants: 2,143 employees 4. Miscellaneous real estate: 1,811 employees 5. Junior colleges, colleges, universities, and professional schools: 1,452 6. Hospitals: 1,391 employees 7. Miscellaneous food and drinking places (non-restaurants; includes bars): 1,187 employees 8. Local government (education): 1,164 employees 9. Management consulting services: 1,134 employees 10. Miscellaneous personal services (including pet care, photofinishing, and parking lots and garages): 1,046 employees Top 10 industries by employment: 11. Miscellaneous real estate: \$482.3 million 12. Owner-occupied dwellings (home ownership): \$351.1 million 13. Directory, mailing list, and miscellaneous publishers: \$264.2 million 14. Book publishers: \$249.3 million 15. Hospitals: \$245.5 million 16. Central Bank, commercial banking, savings institutions, and credit

- 18. Transit and ground passenger transportation: \$198.2 million
- 19. Software publishers: \$196.9 million

2018 IMPLAN Data

57.8% 10+ unit buildings

### BAYONNE

#### **Development Information**

- From 2015 through 2019, 765 new residential units received certificates of occupancy in Bayonne. Of those, 669 (87%) were in multi-family buildings while the remaining 96 were in one- and two-family structures. From the beginning of 2017 through the end of September 2020. 3.192 total housing units were issued building permits according to the NJDCA Construction Reporter. The recent number of permits is nearly 1,000 more than the total number of permits issued in the seventeen year period from 2000 through 2016.
- The April 2020 Hudson County Hazard Mitigation Plan (HMP) identified two recent developments, including a 900 unit project planned to be developed by Bayonne Bay Developers, LLC over a period of years. Numerous other developments totaling over 1,500 new residential untis and commercial developments were identified in the HMP as anticipated over the next 5 years. Several of the projects are in the 100-year flood plain and several others are in the 500-year flood plain.

#### DEVELOPMENT TRENDS CONTINUED

#### **Bayview Redevelopment Plan**

The Bavview Redevelopment Area encompasses the former Bavview Shopping Center, which has been left under-utilized by the closure of the former A&P grocery store. The redevelopment plan splits the area into three districts. The waterfront district is intended to be developed with outdoor recreation, public art, an amphitheater, and a waterfront walkway. The central and eastern parts of the area are mixed-use districts, which are proposed to be developed with multi-family residential units and retail uses in the central part, and multi-family resdiential, offices, hotels, and larger format retail in the eastern part. The full anticipated build out of the area is between 825 and 1.100 residential units with a minimum of 33.460 square feet of retail space, but potentially much more. The plan also grants the redeveloper additional density if they construct off-site public waterfront improvements.

#### 219 West 5th Street Redevelopment Plan

The 219 West 5th Street Area is located in the southwest portion of the City along the Newark Bay waterfront. The plan, adopted in 2020. calls for the redevelopment of one parcel into a multi-family residential development of 180 units, with connections to the adjacent redevelopment projects in the Bayyiew Redevelopment Area to the north. The plan only allows development within the upland portion of the site, and setbacks are required from the mean high water line. The plan also requires public

waterfront access for the development of a continuous waterfront walkway and grants the redeveloper additional density if they construct offsite public waterfront improvements.

#### Exxon Redevelopment

The former Exxon facility, located on Constable Hook, is an approximatley 90-acre property proposed to be redeveloped. A redevelopment plan has not yet been formulated for the property. Anticipated future uses include commercial/industrial and active use of the waterfront.

#### Former Best Foods Site Redevelopment

The former Best Foods site is located in a historically manufacturing-heavy area of Bergen Point, with the western boundary abutting the Newark Bay. The redevelopment plan for the area will transition the site to commercial and light industrial uses and requires on-site or off-site waterfront access development, as well as a 30-foot setback from the Newark Bay bulkheads. Amazon Logistics opened a delivery station on a portion of the site in October of 2020.

#### South Cove Redevelopment Area

The South Cove Redevelopment Plan sets forth requirements for redevelopment of what is presently the South Cove Commons shopping center, adjacent to the Bayonne Golf Club. The site is bound by LeFante Way to the south and the completed Hudson River Waterfront Walkway segment to the north, and the area is almost entirely within the FEMAdesignated 0.2% chance annual floodplain. The redevelopment plan calls for mixed-use development of the area, and proposed projects at the site include construction of a hotel, residential complex, and retail.

#### **Zoning Information**

 HC - The Highway Commercial / Selected Light Industrial Zone is along Route 440 between the Heavy Industrial zone and the residential zones. The zone permits offices, laboratories, commercial / retail / wholesale, light manufacturing, motor vehicle repair and service, and auto sales. A minimum lot area of 2 acres is required, with no other density or coverage controls.

• IH - The Heavy Industrial zone encompasses the Constable Hook area in the southeast part of the City. The zone permits general industrial uses, chemical and petrochemical refining and manufacture, tank farms and bulk storage. A minimum lot area of 1 acre is required, with no other density or coverage controls.

 WD - The Waterfront Development zone is located at the base of the Bayonne Bridge. The zone permits residential, commercial, marinas, docks, boardwalks, wharfs, bulkheads, boat launches, medical facilities, theaters, and offices, Residential development is permitted to be 30 units per acre. The maximum building coverage is 30% for residential and 40% for non residential. The maximum impervious surface coverage is 50% for residential and 80% for non-residential. The purpose of the Waterfront Development District shall be to encourage innovations in residential and nonresidential development and promote flexibility and economy in the layout and design of buildings.

 WR – The Waterfront Recreation zone is at the north end of Constable Hook and is developed with the Bayonne Golf Club. The purpose of the Waterfront Recreation District shall be to facilitate development of recreation facilities. Permitted uses include golf courses, commercial recreation, boat and ferry launches, marinas, fishing piers, and wildlife sanctuaries. Public access and a paved walkway are required along the waterfront.

 IL-B - The Light Industrial District B zone stretches along the City's northeast border with Jersey City and is part of the Bayonne container Terminal. The zone permits offices, light manufacturing, wholesale storage, distribution and trucking, bus terminals, research laboratories, and heavy commercial uses on lots with a minimum area of 20.000 square feet. There are no impervious coverage standard or density controls.

• C-2 - The Community Commercial zone permits retail, services, restaurants, shopping centers, etc. There is no minimum lot area for smaller uses, shopping centers are required to be 2 acres in size.

 R-M - Permits one- and two-family resdiences, townhouses, and high-rise multi-family residential up to 14 stories. The maximum density is restricted by a floor area ratio of 1.80.

#### **Employment Data**

Total employment: 146.630

Top 10 industries by employment:

- 1. Local government (education): 1,435 employees
- 2. Hospitals: 1,391 employees largest employer is Bayonne Medical Center (Bayonne Master Plan Re-examination Report)
- 3. Local government (miscellaneous services): 1,084 employees
- 4. Warehousing and storage: 861 employees
- Limited-service restaurants: 686 employees
- 6. Miscellaneous real estate: 682 employees
- 7. Retail Food and beverage stores: 655 employees
- 8. Full-service restaurants: 644 employees
- 9. Individual and family services: 612 employees
- 10. Central Bank, commercial banking, savings institutions, and credit unions: 602 employees

Top 10 industries by employment:

- 1. Owner-occupied dwellings (home ownership): \$432.9 million
- 2. Tenant-occupied housing: \$252.7 million
- 3. Hospitals: \$245.5 million
- 4. Central Bank, commercial banking, savings institutions, and credit unions: \$227.2 million
- 5. Petroleum lubricating oil and grease manufacturing: \$204.2 million
- 6. Spice and extract manufacturing: \$183.5 million
- 7. Miscellaneous real estate: \$181.6 million
- 8. Wholesale Other nondurable goods merchant wholesalers: \$176.7 million
- 9. Local government (education): \$151.6 million
- 10. Warehousing and storage: \$111.8 million

#### 2018 IMPLAN Data

#### Housing

- 27.272 units
- 8.4% vacant
- 20.5% 10+ unit buildings

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